GAS JOURNAL

LIGHT · HEAT · POWER · BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

PROPRIETORS: WALTER KING, LIMITED. OFFICE 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. —— Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXXIII, No 3276] WEDNESDAY, FEBRUARY 24, 1926. [78TH YEAR.

EDITORIAL NOTES.

Dawn of a New Interest.

RECOGNITION that time's changes demand in the gas industry, as in other spheres of life, new policy and methods has recently extended in valuable fashion; but to-day there must not be any stopping at recognition. That would be fatal. It cannot be impressed too strongly or too earnestly that at the present juncture we have an opportunity of which the utmost use must be made, while the Government have on the stocks something which they believe is going to be of vast value to the electrical rivals of the gas industry and generally to the country. Whether or not it will be is not the matter to be discussed in this article. Our views on the point, it is pretty well known, do not by any means coincide with those of the Government or the Electricity Commissioners; but they do with those of many competent electrical critics. However, there is the important question of opportunity. In connection with the Government electricity scheme, the Central Executive Board of the National Gas Council appointed a strong Committee (as will be seen by the reference on a later page to the special meeting of the members of the Council) to consider the scheme in relation to the interests of the gas industry, and to make recommendations thereon. These were in outline reported to the meeting, and were approved, and practically plenary power was given to the Central Board and the Committee to take whatever action is necessary to safeguard the industry. The same Committee have advised as to steps which should be taken within the gas industry for its internal good, protection, and development; and more on this score may be heard later on. But we would suggest that as soon as it can appropriately be done (which may not be until after the Electricity Bill has been issued), a full and definite report should be made on the development of the industry in the light of changed circumstances—technical, commercial, and competitive. Such a report bearing the signatures of the Committee would have an effect far transcending anything that is likely to issue from mere counsel in the form of a letter or in speeches. The opportunity, we repeat, is one of which the greatest use must be made.

There are wrongs which have been inflicted on the industry which need to be redressed; there are rights which should be conferred. There is one outstanding matter of policy which (it was a topic of many years ago) we have recently revived and discussed, and to which we are pleased to learn much consideration is now being devoted in technical and administrative circles. We hope it will develop largely beyond simple consideration, and will ere long reach full maturity wherever possible. One of the ideas of concentration in electricity generation is to obtain a diversity of load, which obviously is of value in the economical production of electrical energy. Whether the economic effects are wiped-out by the transmission and conversion costs and losses is a matter over which we need not linger to-day, except to say that transmission losses may be 15, 20, and even more p.ct., and transformation can only be effected at about 85 p.ct. efficiency. Centralization of production for a district where materials can be most economically handled and diversity of load are excellent things in gas making and distribution. There is a cry to the larger gas-works from the small towns and villages in rural areas "to come over and help us;" and to do so by opening-out transmission arms to mutual advantage—the advantage to the larger works of bigger scope and greater production, improved efficiencies, a profit above manufacturing and distribution costs, and a field for new development through the lower price and better service which can be rendered in the areas a distance away. We do not say that all large works produce more cheaply than some of the small ones in their neighbourhood; they should be able to do so if of normal character, and if they have been efficiently designed and managed. If well situated and fair sized works are suffering from defects in these respects, the sooner they set about mending their ways and bringing about reformation, the better for their future. A stage has been reached in the history of the industry where plain speaking is required, and where developing work is essential, and possession of open territory a matter of prudence and foresight.

> There is a tide in the affairs of men,
> Which, taken at the flood, leads on to fortune.

The Chairman of the Harrogate Gas Company (Mr. Francis Barber), at the annual meeting the other day, rightly stated that the gas industry could make out a stronger case of usefulness for rural development than any that could be put forward by electricity. Mr. Barber knows that from experience. The Harrogate Company have demonstrated how outside districts can be benefited by the elimination of small works which are expensive producers; and there are other undertakings which can show that consumers, who were formerly called upon to pay 6s. or 7s. and more per 1000 c.ft., are to-day obtaining, through transmission from larger works, gas at much less than the old prices, and since this state of things has existed, the business in those areas has rapidly increased to the point of being doubled, and is still progressing. We know of no amalgamation which has taken place where the consumers in the annexed territory have not secured immediate and progressive benefit; and we venture the view that the same applies where gas is supplied in bulk. The Government regard as a strong point in their scheme the promotion of electricity availability in areas where it is not available now, and at a price at which it could not be secured locally. Availability will no doubt come about, but whether at a lower cost than electricity could be generated locally is an open question. But what the administrators of every gas undertaking with surrounding dear-priced and unsatisfactory supplies have to consider is, whether it is to their future advantage that these conditions should continue, and that electricity under the Government scheme should find its way there—their natural ground for development—to compete with gas at a price so heavy that good development of its use is something beyond hope.

In an article in later columns, Mr. J. H. Brearley points to the benefits which have accrued from gas amalgamations in the past; but regarding the future he finds administrative boundaries, the jealousies of local authorities, and mixed ownership stumbling-blocks to a more rapid advancement in utilizing the best economically situated gas-producing works for the general benefit of the industry and the country. There is also the trouble of the cupidity of some directors of smaller undertakings, who think more of the loss of the emoluments of office and of high compensation than the benefit of the area of supply which their

undertaking serves—perhaps miserably. This is a pity. But all these so-called stumbling-blocks should be capable of removal by bulk supply; for we cannot imagine any body of business men in control of a small or medium-sized gas-works who would refuse to have gas put into their holders at a lower price per therm than that at which they themselves can produce. As to the undertakings which could provide such supplies, we repeat what we have said before, and regarding which we are becoming more and more impressed as we journey through the country-side, that the changes in locomotion are causing larger and larger development for residential purposes of what were at one time out-of-the-way places. Just as high-pressure transmission has brought many such places within reach of economically produced gas supplies, so has the motor-car brought them into reach for residential purposes for the busy city and town man. Railway electrification is also working in the same direction. The advice is sound: Look forward, and act now. Bring to bear upon this question vision, enterprise, and courage. There is no idea of immense concentrations of gas production such as the Government propose for electricity. What is in mind is normal development by the adoption of the policy of creating economy and efficiency in the industry by the fullest application of the best economy and efficiency which now exist and which will progressively arise.

"The Devonport Gas Affair."

WITH regard to what has become known as the "Devonport Gas Affair," which has led to the resignation of Mr. W. P. Tervet, the Engineer and Manager, it appears to us, taking a purely distinterested view of the matter, that a great deal more has been made of it than the facts justified, and (also in our opinion) that it has been discussed in such manner as to do an injustice to men whose name is honoured among the professional men of the gas industry. There are reasons why we cannot at present discuss some aspects of the affair.

There is, however, one matter upon which we are at liberty to make an explanation, and that is the part of the allegations which refers to the arrangement made between the late Mr. Isaac Carr and Mr. Tervet. Correspondence, of which we have copies, places quite a new complexion on this particular issue; and it is only fair immediately to draw attention to it so as to remove any idea that may exist in the gas industry that there was any dealing between Mr. Carr and Mr. Tervet of a secret or venal nature. In the reference to the proceedings of the Plymouth Town Council in our issue for Feb. 10 (p. 360), it was stated that the Chairman of the Committee, Mr. J. Clifford Tozer, said: "As a result "of a communication made to him on Jan. 8 by a member "of the Council, he interviewed Mr. Tervet, who, in reply "to his questions, admitted having received money pay-"ments from a Mr. Carr. The payments commenced in "1920, and the total amount he had received was about "£900." In succeeding lines, the report stated that the Mr. Carr referred to was "a consulting engineer, now deceased." Regarding the £900, as a matter of fact the total payments which were made between 1920 by Mr. Isaac Carr, and since his death by Mr. W. M. Carr, total to £1073, and this over a period of five or six years. The correspondence before us shows that there was no secrecy whatever regarding the matter—that the engagement of Mr. Tervet by Mr. Isaac Carr was a simple one, and, it is easy to conceive, was in the circumstances entirely in the best interests of the Corporation. Mr. Carr, in connection with the extensions of works for which he, as consulting engineer, was responsible at Devonport, required the services of a Clerk of Works to supervise, prepare progress plans, and take measurements on the works. A request was made by Mr. Tervet that he should be allowed to do this work outside his ordinary duties; and he informed Mr. Carr that the then Chairman of the Gas Committee (the late Mr. Tozer) would have no objection to his doing this. In fact, a letter before us states that Mr. Isaac Carr himself discussed this matter with the then Chairman of the Gas Committee, who was quite agreeable to Mr. Tervet's being employed for the work in question. For these services, Mr. Carr arranged to pay Mr. Tervet; and in a letter which Mr. Carr wrote on March 7, 1920, it is expressly and clearly stated that the assistance was to comprise work "outside" Mr. Tervet's "ordinary duties." The paragraph in the letter reads: "This as-"sistance is to comprise work outside your ordinary "duties, and to assist in the preparation of any requisite "detail plans in connection with existing works, also at-"tending to minor details in connection with the various "contracts as the work proceeds." It will thus be seen that the work Mr. Tervet was to carry out, quite apart from the fact that the late Chairman had no objection to his undertaking it, was to be "outside" his "ordinary duties" with the Corporation. It is perfectly plain that this arrangement was completely above board, and not by any means in the nature of a secret understanding as might have been assumed by the manner in which it has been treated in the Council Chamber. With Mr. Tervet's knowledge of local conditions and of the existing plant, and being the man who was eventually to be responsible for the care and working of the new plant, we cannot imagine anyone more suitable to act, in the circumstances, as Clerk of the Works to the Consulting Engineer. Moreover, Mr. Carr's remuneration was based not upon the price at which the work might be executed, but upon his own estimate of the cost of such work. Obviously there could be no question of Mr. Carr benefiting in any way from the arrangement with Mr. Tervet.

So far as the "JOURNAL" is concerned, we deeply regret if the brief report which we gave regarding the proceedings in the Plymouth Council Chamber has conveyed to anyone in the gas industry that the money payment by the consulting engineer to Mr. Tervet was of a nature other than fair reward for work rendered—work which protected the Corporation's interests, and was of value to the consulting engineer in that it enabled efficient surveillance to be maintained day by day.

Electrical Hostility.

IT may be said with a fair amount of confidence that the Government never expected—when they took in hand the work of showing the electricity industry where it has failed, then set about producing a prescription for the cure of its ills, and to all intents declared that (whether or not the industry liked the prescription) it was going to be compulsorily administered—that opposition from within the industry would show itself in such a forcible manner. No Government can afford to overlook the opinions of men in control of the powerful interests constituting the principal parts of the industry. The manufacturers of electrical plant may stump the country, may appear at dinners and make speeches, and may interview newspaper representatives, and say all manner of nice things about the Government scheme; but they are not the people to be reckoned with. They have the direct interest of hoping to do well out of the suggested reformation of the industry. The people who are immediately concerned are those in whose hands the administration and development of the supply of electricity have been placed; and it is from among them that resentment is being shown over the Government plans, and the resentment is gathering strength. So much so that not a few men who, on superficial examination, at first hoped for much from the Government's "assistance" to the industry are crossing-over to, and identifying themselves with, the mass of antagonistic opinion already accumulated. It is clear, too, that the scheme is not helping to establish the Electricity Commissioners as a controlling body more firmly in the affections of electrical men. The Commissioners have done good work; but not all they have done has been generally approved. The industry has felt the power of the Commissioners; and, in many quarters, there seems to be no particular fancy to have that authority increased.

An imposing and influential unit in the electricity supply industry is the Yorkshire Electric Power Company. At the annual meeting of the shareholders the other day, there was some very plain speaking by the Chairman (Mr. A. G. Lupton), which must make a considerable impression upon the Parliamentary representatives and the industrialists in the large area within which the Company operate. The Company, faced by many difficulties, have, without Parliamentary help, been doing precisely what the Government are proposing; and Mr.

Lupton states that he cannot believe any necessity exists for interfering with the development of electricity supply on the lines the Company have been following for many years. Nor can anyone else, excepting perhaps the Electricity Commissioners, who, there is little question, are dissatisfied with the existing limitations to their powers in carrying out their electricity generation and transmission policy. Here is a Company whose mains extend over large areas; throughout the West Riding there is one frequency of alternating supply; co-operation between the Company and municipal authorities has been firmly established, and is growing; many of the principal stations are now connected to the Company's mains with mutual advantage; and many small stations have been eliminated, and supply given in bulk to the undertakers. The Government scheme could do no more than this; and it has all been accomplished, as Mr. Lupton says, without a State subsidy or other assistance. To him any Government assistance is repugnant; and there is no question that he prefers, as tending to progressive stability, normal methods to forced ones. Probably Mr. Lupton knows or feels that any Government assistance must be accompanied by a form of departmental control which never lessens but always grows. The Government talk of economy, and propose the introduction of an Economy Bill; and simultaneously spend freely—not always on those things that are immediately needed, especially having in view the nation's present financial circumstances. They even propose for an industry legislation which will initiate and compel the spending of millions, though many competent authorities aver that it is totally unnecessary. Note what Mr. Lupton says: "The great need of the "country at the present time is rigid economy, both in "national and local expenditure. The electrical industry "is in competition with other forms of motive power, and "with the great gas industry; but it is strong enough "to stand by itself. It can obtain on reasonable terms "the capital required, and does not need the assistance of "State subventions to be paid by the already over-bur-"dened tax and rate payer; but, on the other hand, it "must be allowed to develop without too much depart-"mental interference and delay." Yet the Government at first proposed a subsidy, which they dropped, through the strong opposition in the ranks of all political parties, and partly because the contemplated financial help was a preference to one industry and an injustice to another. The same description applies to the assistance of another order which is being tendered.

There are still the guarantees; and the price that has to be paid for these and for the advertisement which (as we pointed out on Feb. 10) the Prime Minister and Cabinet Ministers have been giving to electricity is something the industry is not regarding with equanimity. The additional capital burden the scheme proposes to impose on the industry is bad enough; but the compulsory forfeiture of much industrial autonomy is something which (there is no secret about it) is distinctly intolerable to the most advanced thinkers in the industry. It is clear that the view of Mr. Lupton is that the plans of the Government for supplementing by a general controlling body present administration in respect of generation and transmission, and setting present administration in a secondary position, is an act which will be prejudicial to the interests of the industry. It is folly to tell the industry that this is not so; for it is plain that in administration individuality and special local knowledge are to be to a large extent replaced by a system of control common to the whole country, which will be less appreciative of the differences in requirement of the various areas, each with its own special interests. Mr. Lupton draws attention to this change for the worse. He says the scheme as outlined by Mr. Baldwin suggests the establishment of a small body of men to deal with the electrical needs of the country as a whole. It is beyond his conception that such a body will be able to know the needs of the different industrial areas as well as the boards of directors of the power companies. In the case of the Yorkshire Company, he declares the Board consists of a body of active Directors who not only give considerable time and thought to the affairs of the Company, but represent the various industries and inhabitants of the West Riding, and know the district intimately as well as being resident in and personally known therein. Mr. Lupton's argument, and the object-lessons he is able to advance, cannot fail to influence the minds of many men whom the Government, or rather the Electricity Commissioners, would rather know were willing to give generous support to the scheme. But they cannot give support to something which they are not persuaded is in the best interests of the electricity industry or the country generally.

Minimum Sliding-Scale Dividends.

AMONG share and stock holders we find that a great deal of interest is being manifested in the application by the Gas Light and Coke Company for the introduction of a minimum dividend into the sliding-scale. It is a means of giving greater confidence to investors after the rude shock they had of the failure of the sliding-scale to defend their interests during the long years of war and the immediately subsequent ones. To gain that confidence must be of considerable value to gas companies in these times in relation to the raising of new capital, and to the improving of its status generally as a security. At the time the South Metropolitan Gas Company introduced the variation from the sliding-scale of a basic price and basic dividend, the proposal strongly appealed to us from both the point of view of gas undertakings and that of investors; and we were able to look at the matter from both angles sympathetically and with personal interest. The attitude taken by the "JOURNAL" towards the change brought from two or three prominent gas engineers and administrators private communications expressing the opinion that the sliding-scale, with the revision of standard price permitted by the Gas Regulation Act, did all that was necessary in regard to protecting the future of gas stock proprietors. But we adhered to the view that a basic or minimum dividend would secure still greater confidence. Lately it has been noticed that the ability to revise standard prices is not regarded by some share and stock holders as an unmixed blessing. One stockholder has recently indicated his view that it is not calculated to produce confidence to find that, immediately there are somewhat better conditions (though gas undertakings have been passing through circumstances which have depressed the revenue account in one direction or other), there are local authorities who consider their duty to the public is to apply promptly for a reduction of the standard price. While fully agreeing with those who complain of such action, there is always the other aspect—that gas companies have the power conferred upon them by the Act to make application for a revision when the economic conditions are against them. At the same time, there is a sense of security in a minimum or basic dividend; and, in our opinion, all gas companies who are under the sliding-scale should take steps to obtain the introduction of this additional assurance to their position in the world of finance. It must be remembered that conditions are far more sensitive and unstable in these days than they were when the sliding-scale was introduced. Competition for capital and business and new labour conditions have alone wrought considerable differences, and are the causes of economic disturbances. As we have recently seen, too, even the Government can cause trepidation among investors in one industry by taking a more or less grandmotherly concern in another industry. But perhaps the greatest change which has come about since the sliding-scale was introduced is business competition, which is a greater compelling force in looking after the interests of consumers than the sliding-scale ever was or is likely to be. It is absurd to-day to talk of the monopoly of gas. With competitors all around, the monopoly of one agent for light, heat, and power is an insignificant thing when there is no monopoly in the provision of light, heat, or power. Coal, electricity, and oil challenge any suggestion of a monopoly for gas, precisely the same as gas stands as the negation of any monopoly for those purposes on the part of the other agents. Gas coke is assailed by smokeless solid fuel derived from other quarters, tar for road purposes by bitumen, and sulphate of ammonia by the ever-increasing capacity of plant for the production of synthetic nitrogen, and the development of other sources of nitrogenous fertilizers. There is competition all round. The case for a minimum dividend is very strong.

Competition and Gas Progress.

WHEN the activity of our electrical competitors is considered, it may seem remarkable to some laymen that gas undertakings have the last few years been making such rapid strides in the heating and cooking lines. But on consideration, it seems to us that the activity of the electrical competitors in getting people to launch-out into experimental electrical heating and cooking is having an excellent auxiliary effect upon the activities of the gas industry. The experimental electric heating and cooking produces experiences which give the public an opportunity of making comparison, which is not, to our electrical rivals, of a beneficial order, and therefore is advantageous to the gas industry. The reports now reaching us from all parts of the country tell a consistent tale of the continued flow of new heating and cooking business. The Commercial Gas Company's undertaking is the smallest of the three Metropolitan ones. The Gas Light and Coke Company are ten times the size of the East-end concern, and the South Metropolitan Company four times; but the Commercial Company have their own peculiar circumstances with which to contend. Certain of these may be noted in the address from the chair of Mr. W. Graham Bradshaw to the proprietors last Thursday. One of the many interesting features of the speech was a statement as to the Company's progress despite competition as severe as can be found in any part of London. Yet there is no anxiety on the part of the Directors. Accrued experience hardens their belief in the future of the Company and in the popularity of gas. The Company have in their district Poplar and Stepney, and have to compete with the lowest priced electricity in London. Yet the extension of the business attests successful competition. When dealing with the Company's accounts twelve months ago, Mr. Bradshaw drew attention to the large demand there had been for gas-stoves; that demand persisted throughout the year under review, and is still going strong. And now the Company have 112,254 stoves at rental, which is equivalent to 96 p.ct. of the consumers. But this figure does not represent the total number of stoves on the district. In 1924, the Company sold, either for cash or hire-purchase, 1291 heating and cooking stoves; last year, the number was 1679. There is no question, too, that a large number are in use which have been purchased from sources other than the Company. But this shows that, despite the pared prices for electric heating and cooking in the Company's area, the demand for gas continues to bound forward. It is a long time since we had data from gas undertakings showing how the percentage of gas heating and cooking stoves on hire stands in relation to the number of consumers. If any of our readers care to send their percentages along (supplemented, if a survey has enabled them to make the calculation, by the percentage of the total on hire and privately owned), we shall be pleased to publish the figures. They have a stimulating value in areas where the percentage is low.

Gas Finances in 1924.

PART 2 of the Board of Trade returns relating to authorized gas undertakings in Great Britain for 1924 has been issued; and it treats of the finances of 782 concerns. This is two less than the number dealt with in Part 1 of the returns, which were noticed last year in our issues for Aug. 5 (pp. 327, 333) and Aug. 12 (p. 384). This small reduction is due to amalgamations—Chester-le-Street and the Walker and Wallsend Companies have been merged in the Newcastle-upon-Tyne and Gateshead Gas Company; and the Godstone undertaking has become part of that of the Redhill Gas Company. It is seen that the total nominal capital invested in the undertakings was £168,405,774, which is made up of the paid-up capital of 467 companies, £85,537,819; issued loan capital, £22,544,907; and (relating to 315 undertakings) the money borrowed by local authorities for their gas departments, £60,323,048. Of the last-named figure, £31,746,240 has been repaid, or provision made for repayment in the balance in the sinking fund. If we look back five years—to 1920—it is seen there were then 494 companies included in the returns, and 304 local authority concerns. The paid-up capital of the companies then amounted to £82,065,243; issued loan capital, to £18,418,665; while the total amount of money borrowed by the local authority undertakings was in 1920-21 £48,916,008. These three figures total to £149,399,916; so that the expended capital of the statutorily authorized part of the gas industry has increased in the five years by £19,005,858. That so much additional capital should be required is a good index of the expansion of the industry, although it cannot be overlooked that capital costs are in these times considerably in excess of what they were pre-war in relation to the business done.

Looking at the revenue figures, it is seen that the receipts of the companies were very little in excess of those for 1923; while those of the local authorities were much less. The receipts of all the undertakings were lower by £866,368 compared with the preceding year; while the expenditure was more by £1,293,727—making a decrease on the gross profit of £2,160,095. In both cases the receipts were considerably less than those for 1920. Of course, the explanation of this is that, owing to the cost of coal five years ago, and notwithstanding the good returns then being obtained from secondary products, the price of gas had to be much higher than has been the case during the years which have since passed. The total receipts of the companies in 1924 amounted to £44,293,709, compared with £53,714,841 in 1920; but the expenditure in 1924 was £38,756,098, as against £49,566,608 five years ago. The companies' profit in 1924 amounted to £5,537,611, which contrasts with £4,148,233 in 1920; but although the profit was greater in the former year, the capital employed was, as already indicated, much heavier. Regarding the local authority undertakings, the receipts on revenue account in 1924-25 amounted to £22,416,281, which compares with £27,244,570 in 1920-21. Here again, we have the same experience with regard to both receipts and expenditure as in the case of the companies. While the receipts were much lower in 1924-25 in relation to five years ago, the expenditure was also lower—viz., £19,131,529, as against £24,535,685 in 1920-21. The gross profit, too, shows an improvement—viz., £3,284,752, as compared with £2,708,885 in 1920-21. But here we are given a reflection of the growth of the capital charges in the five years; for, in the case of the local authority undertakings, the interest paid on loans, amount of loan repaid, and amount placed to the sinking fund during the year, reached £3,026,677, as compared with £2,269,573 in 1920-21. The result is that, in the case of the local authority undertakings, the balance remaining in 1924-25 was only £258,075, compared with £439,312 in 1920-21. Hence we see that in 1924-25 the receipts of all the undertakings amounted to £66,709,990; and the expenditure to £57,887,627—thus leaving a total gross profit of £8,822,363.

Ordinary Capital Sinking Fund.

In connection with the discussion of the question of policy in the gas industry, Mr. W. R. Herring, as seen in our "Correspondence" columns, sends another suggestion which he believes to be worthy of serious consideration at the present time. It is that, in the face of State-fostered competition, a strong case could be made out for a capital sinking fund for gas companies—not only in the interests of the present holders of stock, but also to enable the companies to finance their operations on the cheapest possible terms. Towards the close of his letter, he says: "A sinking fund of 1 p.ct. on the ordinary stock invested outside the business would, at compound interest, greatly strengthen the financial status of each company, and in a few years would create such security as probably to equal in effect its cost at the outset. A penny per 1000 c.ft. is approximately equal to 1 p.ct. on the ordinary capital used. An immediate charge of (say) ½d. per therm is not a formidable premium to pay for the substantial financial advantages which such a policy would bring in its train." On more than one occasion, attempts have been made to induce Parliamentary Committees to permit of capital sinking funds; but with the exception of one or two cases, and to very limited degree, the proposal has usually been turned-down. In the projected circumstances, Parliament might now be disposed to take a more reasonable view of such a proposal—more particularly as we believe it could be shown to be in the interests of both shareholders and consumers.

Coal Commission and Subsidy Expenses.

The House of Commons has passed a supplementary estimate of £16,757 for salaries in the Mines Department of the Board of Trade. This addition relates entirely to matters which could not have been anticipated when the original estimate was introduced—the setting-up of the Royal Commission, the granting of the coal subsidy, and the compilation of a catalogue of abandoned mines.

Gas Demonstration at Cardiff.

We learn that the "Western Mail" Better Housing and Housekeeping Exhibition at Cardiff has been highly successful during its fortnight's run. By the time it closed on Saturday evening, some 55,000 to 60,000 people had visited it. A large amount of interest was shown in the gas appliances on view. In all, about seventeen of the makers of gas-using apparatus co-operated with the Cardiff Gas Light and Coke Company in their efforts to stage a really fine display of the wide range of utility which gas serves, and the efficiency with which it, by the aid of such appliances, performs its duties. Mr. H. D. Madden, the Company's Engineer and Manager, tells us that all on the gas side are especially delighted with the interest displayed by the public, as well as with the large number of inquiries made and orders taken. What also impressed him was the great enthusiasm in the ranks of both his own Company's staff and of the appliance makers. This culminated on Saturday evening after the Exhibition had closed in a very happy smoking concert.

Coal Developments in Kent.

There was great excitement in Kent last week when a notification regarding guarantees under the Trade Facilities Act made it known that the Treasury are prepared to guarantee to Messrs. Pearson & Dorman Long, Ltd., both principal and interest of £2,000,000 for a period of thirty years, to carry-out extensive schemes for the development of the Kent coal-fields. Some picturesque statements as to what is in store have already appeared in the public Press. The computation of Dr. Aubrey Strahan, the Assistant Director of the Geological Survey, that there is a reserve of 2000 million tons of coal in the district has been noted. While this may be more or less hypothetical, other experts have put the life of the coal-field at 400 years, but at what rate of working is not said. It is anticipated that a proportion of the output will be converted into electrical power for London and for supply *en route*. The steam coals containing below 25 p.ct. of volatile matter, it is said, will be used for the production of power; the gas coals will be carbonized at low temperatures for the production of smokeless fuel, benzole, and other products. Other experts are of opinion that it will be better to transport the coal than the electricity, and let the people who produce and sell gas and electricity deal with the coal locally. This view is supplemented by objections as to the strategic danger of having the electricity supply of London centralized in an area which invites attack by enemy aircraft. Messrs. Pearson & Dorman Long, Ltd., must smile hugely over all that is being stated in the newspapers as to their plans.

The Road Fund.

The attempts made last week to extract from the Chancellor of the Exchequer his actual intentions regarding the Road Fund ignominiously failed. He has been attacked from all sides; but he has remained as mute as a sphinx regarding what he has in mind. It is all being saved up for the Budget speech. Mr. Dixey, in the Commons, tried to bind the Government by a definite pronouncement of the House; but it was no use. Mr. Churchill was also interviewed by the representatives of twenty-one organizations connected with motoring and the motor industry. They were politely but plainly told that they did not pay taxes voluntarily, and that he could not accept the view that they should have the right to prescribe how the money should be spent. Further, it could not be said that motorists had entered into any treaty with the Government on the question of the fund. However, Mr. Churchill gave the assurance that, when his Budget was presented, it would be found that neither the progress of the motor industry nor the normal reasonable development of roads would have been seriously injured or violently arrested. The Chancellor evades the point.

Miners and the Coal Report.

The Executive Committee of the Miners' Federation have decided to hold a national delegate conference immediately following the issue of the report of the Royal Commission on the mining industry. It is stated by one Labour correspondent that if the delegate conference has to discuss and determine the wage policy of the Federation, it may be taken that it will be along the following lines: The continuation of the present system of district wage boards to regulate the wages within the limits of a nationally fixed minimum percentage on the basis rates of the collieries in the area. The continuation of the present seven-hours' day, whatever recommendations may be made in the report of the Royal Commission, or by the coalowners. On these matters Mr. Herbert Smith, the President, and Mr. A. J. Cook, the Secretary, have stated the Federation policy as "not a penny off wages, not a minute on the working day." Also putting into operation Part II. of the Coal Mines Act of 1920. Last Friday a Sub-Committee of the Miners' Executive met the Industrial Committee of the General Labour Council to consider the situation. Subsequently the Council issued an official report, which reiterated that the attitude of the trade union movement would be to stand firmly and unitedly against any attempt further "to degrade the standard of life in the coal-fields." There is to be no reduction in wages, no increase in working hours, and no interference with the principle of national agreements.

Miners Abroad and the Subsidy.

It is stated that the members of the Miners' International in other countries are strongly antagonistic to the subsidy which the British mining industry is receiving, and have been operating to counteract its effect in their own countries—and apparently successfully. While the Miners' Federation appear to be working for the wrecking of the British coal industry, the Continental miners have an eye on securing those economic conditions which will maintain the industries which give them employment. No one wants wages reduced in the mining industry; but it is absurd to say that output per man employed must not be increased so as to place the industry in an economic condition which will enable it profitably to compete for overseas trade, and thus to live.

PERSONAL.

Mr. ANDREW WILSON has been appointed General Manager and Secretary of the Australian Gas Light Company, Sydney, N.S.W. Mr. Wilson joined the staff of the Company in 1908, since when he has respectively filled the offices of Assistant Engineer and Chief Engineer, succeeding the late Mr. Thos. J. Bush in the latter capacity. He comes of a family which has long been associated with the gas industry; his grandfather, the late Mr. Andrew Wilson, having been Manager of the Stewarton Gas Company. His father, the late Mr. Thomas Wilson, Engineer and Manager of the Coatbridge Gas Company, was one of the best known of the last generation of Scottish gas engineers. Mr. Wm. Wilson, Engineer of the Burton-on-Trent Corporation Gas Undertaking, is his brother. Mr. Wilson served his apprenticeship under the supervision of his father, passing through the works of the Coatbridge Gas Company, the drawing office of the Barrowfield Iron Works, the fitting shop of Lamberton & Co., of Coatbridge, and the laboratory of Mr. R. R. Tatlock, the late Glasgow City Analyst. Before joining the staff of the Australian Gas Light Company, he filled the positions of Assistant to the late Mr. Joseph Hepworth, of the Carlisle Gas-Works, of Engineer and Manager of the Perth Corporation Gas-Works, and of Deputy Engineer of the Bradford Corporation Gas-Works. Mr. Wilson is the first General Manager to be appointed by the Company; the control of the Company's affairs having previously been jointly vested in the Chief Engineer and the Secretary. The recent resignation of Mr. C. U. B. Gurnett from the office of Secretary of the Company has been made the occasion of the amalgamation of the two offices; and Mr. Wilson will now be in full charge of the Company's operations. The Australian Gas Light Company was established in 1837, and ranks in size with the Manchester and Liverpool gas undertakings, its capital being approximately £5,250,000.

We regret to learn that Mr. J. C. WALKER, the Secretary and Assistant Manager of the British Commercial Gas Association, had last Saturday to undergo a rather serious operation. His numerous friends in the gas industry will, however, be gratified to learn that the latest news from the nursing home is that our friend is going on as well as can be expected.

At a meeting of the Leicester City Council on Feb. 9, it was decided to increase the salary of Mr. HUBERT POOLEY, the Gas Engineer, from £1472 to £1750 a year.

ELECTRICITY SUPPLY MEMORANDA.

REPORTS from different parts of the country convey the intelligence that an increasing number of local authorities are of opinion that the deferring of consideration of electrical schemes—new or extension, or for the purchase of electricity in bulk—is an act of prudence in view of Government proposals and anticipations. It is also stated that electrical engineers are beginning to encounter trouble with new consumers. Those who are likely to be large customers are reluctant to enter into definite contracts for energy on the ground that time and Government help will produce lower charges, of which they feel they should ensure enjoyment when they come along. The electrical engineer on his part is filled with dubiety as to the Government scheme producing anything better than he himself can provide. Other consumers, it is understood, are of opinion that the Government's prediction of cheaper electricity for all shows that the present suppliers are not doing their duty to the public. It is evident that Government interference in the affairs of the electricity industry, with a view to boosting its development in a way which they believe the present undertakings are, unassisted, totally unfitted to bring about, is creating an uncomfortable time for those who have upon them the executive responsibilities of electricity concerns. Anyway, one thing the Government are doing is to educate people to believe that existing suppliers of electricity have not been true to the trust reposed in them, and that only by the intervention of Parliament can the public be relieved from this monstrous condition. The effects of this educational work by the Government will live, and for some time to come will make things unpleasant for the administrators of electricity undertakings. It would not be surprising also to find that it will stimulate applications for reductions of price; and yet it is a fact that in many districts to-day the charges for electricity are as low, with a smaller consumption *per capita*, as those in (say) the United States, where the consumption is much larger per head. "Meteor" of the "Electrical Times" is of opinion that the lay Press should be authoritatively informed that the Government scheme cannot possibly ensure much economy for six or seven years at least, and that its main and major effect will not be conspicuous for anotner ten or twelve years.

Creators of Difficulty.

The case of the small stations in relation to the scheme continues to be argued. As the annual report of the Electricity Commissioners shows, some of these stations can claim an efficiency equal to that of many much larger ones. The point has been made in electrical circles that it is totally unfair that small stations with high efficiencies should be forced to purchase supply in bulk which, there is every reason to believe, will work out to a figure exceeding present local generating costs. There should, of course, be discrimination regarding their elimination, and compulsorily turning them over to bulk purchase. But what is now proposed under the Government scheme (which it is politically asserted is not going to inflict control on the industry) means that the judgment of the administrators and managers of highly efficient small stations is to be suppressed by law, and their freedom of action entirely taken away from them. Such a course, it appears to us, simply reduces electrical administration to a foolish condition, especially when it comes to making small stations which are doing well pay more for a supply in bulk (including transmission and transformation) than the price at which they themselves can generate. Illustrating this point is a letter in the "Electrical Times" by the engineer of one of the small and medium-sized 400 or 500 stations which it is proposed, as time passes, to shut-down under the Government scheme. Five years ago, he states, the undertaking for which he is responsible arranged for a bulk supply from a super-station. All the direct current for the centre of the district is generated locally, except between the hours of 10 p.m. and 6 a.m., when it is supplied through rotary converters from the bulk supply. The energy purchased in bulk last year cost the undertaking an average of 0·948d. per unit, with a load factor of 32·2 p.ct. The units generated locally cost at the direct-current switchboard 0·706d. per unit, with a load factor of 17·7 p.ct. To make this figure comparable with bulk supply, there have to be added the capital charges on the generating plant, representing a further 0·25d. per unit, and making a total generating cost of 0·956d. per unit. Still another correction has to be made before the figures are fairly in line. The local supply generated is low-pressure, ready for immediate use. The bulk supply has to be transformed and converted to direct current. The average overall efficiency of the transformers and rotary converter is 85 p.ct. Allowing for these losses, the generating costs at the main direct-current switchboard are: Bulk supply, 1·115d.; local generation, 0·956d. The writer states that the difference between the two, on the basis of last year's figures, shows a saving in favour of local generation of nearly £2000. Another point to be noted is that, with an average overall efficiency of transformers and rotary converters of 85 p.ct., 3,114,185 units would require to be purchased from the bulk supply to provide 2,647,056 units at the direct-current switchboard. From these figures it is seen that it would have been necessary to purchase in bulk at an average cost of 0·205d. per unit to equal last year's local generating costs. The writer asks: "Is there a super-power station in existence that is prepared to give a supply at this figure? Manchester last year, with an output of 257 million units, had works' costs (exclusive of capital) of 0·73d. per unit. Adding capital charges, the cost would be well over 1d. per unit." It is simply ridiculous compulsorily to transfer the custom of a small station working so efficiently as the one in question to bulk supply to the detriment of the consumers.

Small Stations and Bulk Supply.

"Meteor" of the "Electrical Times" has detected a terrible danger. It is the quiet but determined propaganda all over the country in favour of a *rapprochement* between the gas and electrical interests. It is argued that only by collaboration can they derive the maximum benefit from coal *pro bono publico*. This gospel, he tells us, is being preached in the leaderettes of provincial newspapers far and wide. If it is, and if effective, so much the better for the future economy of the country. However, to the Electrical Commissioners our friend is grateful at least for one thing. Their proposals, so far as they are known to him, bear no suggestion of such a nature, and their scheme is honestly all-electric. Premature experiments in the pre-treatment of coal, he also mentions, were expressly deprecated in the Weir report. "Meteor" holds that the processes of the two industries are not mutually helpful; they clash. Where and in what way? "Doubtless," he says, "it would suit the gas interests for us to consume their coke. The use of their coke might not profit us." It profits more distinguished electrical engineers than "Meteor" to use coke, at any rate on the patented "Sandwich" system, for by that means they get higher efficiencies than they can do by using cheap low-grade coals or slacks under their boilers without the assistance of the porous coke with its high carbon constitution. Mr. Thomas Roles, the Electrical Engineer of Bradford, is quoted by our contemporary as having stated that the conservation of coal is less important just now than the conservation of capital, and thereby, "Meteor" says, hangs a tale, and one that should be pondered. Mr. Roles was, of course, alluding to the heavy expenditure contemplated upon the electrical scheme, with the view of attempting to bring down the average pounds of coal used by the industry per unit generated. "Meteor" develops the idea that the electricity industry might prefer, instead of buying coke, to sell gas to the gas industry. Before they could do that, they would have to incur a greater expenditure of capital than that contemplated for the Government scheme. We are afraid the electrical industry, if it adopted pre-treatment of coal, would find it a serious handicap and burden—a far more serious one than "Meteor" is able to comprehend. In the first place, the gas would have to be supplied into the local gasholders at a price as cheap as, or rather cheaper than, it can be produced *in situ*. The quantity of coal the electricity industry would have to handle would be enormously greater than now. The whole of the bye-products would have to be marketed; and there is an economic limit to the absorptive power of the world's markets. These things can only be dealt with by an industry with a large market for its primary product, and with a latitude in price for that product which will allow, when necessary, compensations being obtained from it for the vagaries of the bye-product markets. It is pretty clear that "Meteor" lacks the capacity for realizing the facts of this particular matter. On another point he need have no fear. The capital of the gas industry is not likely to become derelict while the efficiency of its processes has such a distinguished superiority to the efficiency of the electrical process. His remarks in this regard are worth quoting if only to show what can be produced by a curbed imagination: "It is from the point of view of capital invested that any collaboration with the gas interests would be most perilous. Were we to lie in the same bed with them, we should be overlain from the first. Eventually, when the demand for gas began seriously to diminish, we should be suffocated. For there would inevitably be an attempt to transfer to the growing electrical industry the burden of their enormous derelict capital." We can leave "Meteor" there, as well as the quotation from his writing which, without comment, will give amusement not only to men in the gas industry, but to many men of brains in the electricity supply industry.

A Danger to be Watched.

There is one thing the electricity industry is mightily perturbed over in connection with the electricity scheme; and it is that the capital expenditure and transmission and transformation costs will annihilate any little fuel economies per unit which the concentration of generation will bring about, and so impose additional liabilities on the industry. Regarding the "estimates" for the also "estimated" conditions for which there will have to be provision, the Electricity Commissioners state that these are all right, for

The Model and Its Estimates.

they have been made by them, and they have had them checked to see that no error has crept into their arithmetic. A large part of the costs is to be for transmission works in which copper will play an important part. An exporting combine has been effected in the United States which control some 60 p.ct. of the world's supply of copper; and they are going to see to it that more is paid for copper by the countries that require it. Whether the estimates will work-out according to calculation will, of course, very largely depend on the Central Executive Board which is to be set-up under the Government scheme, to which Board all the subsidiary controlling and advisory bodies will have to bow; while the Central Executive Board will have to approach the Electricity Commissioners, who, in turn, will have as their superiors the Ministry of Transport. However, the Premier recently said that the contemplated Central Electricity Board will be fashioned on the model of the Mersey Docks and Harbour Board or the Port of London Authority. An interesting disclosure has been made within the past few days regarding mistakes in estimates for reconstruction work by the Mersey Docks and Harbour Board, amounting to £421,000. On work to the outer entrance to the dock, it is stated, there was an error of £316,000, bringing the total estimate from £651,000 to £967,000; and an under-estimate for the inner entrance work has raised the original estimate from £227,000 to £332,000. This was described in the published report as a very "unfortunate blunder." The Central Executive Electricity Board, modelled on the lines of the Mersey Dock and Harbour Board, will have to deal with what are largely unknown conditions. Estimates for the electricity scheme have been made on obviously vague fundamentals; and many millions of pounds have been pictured as the probable expenditure in the next seven years. Not a few men in the electrical industry are persuaded that what is presented now as the ultimate cost will make remarkable flights. The Mersey Docks and Harbour Board will provide a precedent for estimates more than 50 p.ct. below the actual sum. With this example before them, there need be no hesitation on the part of the Central Electricity Board regarding an increase of every estimated million to a million-and-a-half. When dealing in millions, an extra £400,000 or £500,000 per million of estimated expenditure it may be thought by the Government is not a matter which need occasion any disquietude. But the fact is the electricity industry is a bit uneasy. Small wonder!

NATIONAL GAS COUNCIL OF GREAT BRITAIN AND IRELAND.

The Government Electricity Scheme.

An Emergency General Meeting of the National Gas Council took place in the Wharncliffe Rooms, at the Hotel Great Central, Marylebone Road, London, N.W. 1, on Wednesday, Feb. 17. Mr. D. MILNE WATSON, D.L. (President of the Council), presided; and the following occupied seats on the platform: Mr. Francis Barber, Mr. C. F. Botley, M.Inst.C.E., Mr. C. E. C. Browne, Mr. Wm. Cash, F.C.A., Mr. W. Doig Gibb, O.B.E., M.Inst.C.E., Mr. J. H. Ellis, Mr. F. W. Goodenough, C.B.E., Mr. Thomas Hardie, M.Inst.C.E., Alderman Sir Wm. Kay, J.P., Alderman F. S. Phillips, J.P., and Alderman J. H. Waddington.

The PRESIDENT explained that the meeting had been called together in order that members might be kept informed of the steps which the Council had taken to safeguard the position of the gas industry in connection with the Government's electricity proposals. The Minister of Transport had invited representatives of the Council to meet him in conference on Friday, Jan. 22, with regard to this matter, and on that occasion had submitted the outline of the Government's proposals. At a subsequent meeting of the Central Executive Board, when the matter was discussed, the following Committee was appointed to draft a memorandum on the position from the point of view of the gas industry:

Mr. C. F. Botley, M.Inst.C.E.
Mr. Wm. Cash, F.C.A.
Sir Arthur Duckham, K.C.B.
Mr. F. H. Jones, M.Inst.C.E.
Alderman Sir Wm. Kay, J.P.
Alderman F. S. Phillips, J.P.
Mr. A. W. Smith.
Mr. S. Tagg, M.Inst.C.E., J.P.
Mr. D. Milne Watson, D.L. (*ex officio*).

Mr. Milne Watson proceeded to explain at considerable length the recommendations of the Drafting Committee, and stated that such proposals had received the sanction of the Central Executive Board at a meeting held that morning.

Several representatives of the Council addressed the meeting; and the following resolution was unanimously passed:

"That this meeting approve the action taken by the Central Executive Board, and authorize the Board to proceed with this work."

The meeting closed with a vôte of thanks to the President, moved by Alderman F. S. PHILLIPS, and seconded by Alderman Sir WILLIAM KAY.

FORTHCOMING ENGAGEMENTS.

Feb. 26.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute. Short Paper Evening.
Feb. 26.—NORTHERN STAR LODGE.—Meeting at the Midland Hotel, Manchester.
Feb. 27.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Visit to the Street Mains Section of the Glasgow Gas Department, Dalmarnock.
March 5.—MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.—General meeting at the Midland Hotel, Manchester.
March 9.—NATIONAL GAS COUNCIL.—Meeting.
March 9.—FEDERATION OF GAS EMPLOYERS.—Meeting.
March 11.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual general meeting at Birmingham.
March 18.—MURDOCH LODGE No. 3480.—Installation meeting.
March 23.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual general meeting at the Hotel Cecil.
March 24.—EVENING STAR LODGE No. 1719.—Installation meeting.
May 6.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring meeting at Ipswich.
May 13.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Spring general meeting at Dudley.

INSTITUTION OF GAS ENGINEERS.

March 9.—Education Advisory Committee.
March 10.—Emergency Committee, Finance Committee, and Benevolent Fund Committee.

Institution of Public Lighting Engineers.—At a recent meeting the programme of the Institution's annual meeting, which is to take place at Newcastle on Sept. 14, 15, and 16, was considered and approved. It was decided to hold an exhibition. This will be opened by the Lord Mayor of Newcastle on the first day, followed by a reception and a tour of inspection of the public lighting of the city. On the second day the session will be opened by the Lord Mayor, when, in addition to the President's address, four papers will be given on lighting. An excursion is to be arranged for the final day.

Radiant Heat Furnaces.—For some five years past, Messrs. Krupp, of Essen, have, according to "Engineering," been engaged in the development of a series of industrial furnaces employing the principle of surface combustion; and they have now upwards of a hundred of these furnaces in operation in their own works. The results obtained with them have, our contemporary understands, been so satisfactory that it is proposed in the near future to instal about 500 more in the Krupp works alone; and many others are now in operation in various works on the Continent. The sole manufacturing and selling rights for the British Empire for the Krupp radiant-brick furnaces, as they are called, have recently been acquired by Messrs. Stein & Atkinson, Ltd., 47, Victoria Street, Westminster, who will carry out the construction of the furnaces in Great Britain. They are made for practically all industrial heating processes—such as re-heating, forging, welding, annealing, tempering, hardening, metal melting, and the manufacture of glass and pottery. Any kind of clean gas—including town gas, Mond gas, blast furnace gas, and coke-oven gas—can be used as fuel.

BOARD OF TRADE GAS UNDERTAKINGS RETURN FOR 1924.

PART II.—FINANCE AND PRICES.

There was recently issued by H.M. Stationery Office (Adastral House, Kingsway, London, W.C. 2, and Branches), at the price of 10s. 6d. net, postage extra, the second part of the Return for the year 1924 relating to all Authorized Gas Undertakings in Great Britain. This gives the customary statistics bearing upon finance and prices; while Part I. (which was reviewed in the "JOURNAL" for Aug. 5 and Aug. 12 last) dealt with manufacture and supply.

There are 782 companies and local authorities included in the part of the return just issued. This is two less than were dealt with in Part I. The Chester-le-Street undertaking and the Walker and Wallsend undertaking have been merged in that of the Newcastle-upon-Tyne and Gateshead Gas Company, and the Godstone undertaking in that of the Redhill Gas Company; while, on the other hand, the gas undertaking of the Helston Corporation has become statutory. On this occasion the companies, at 467, are eight less than was the case a year ago; but the local authorities, at 315, number five more than in the 1923-24 return.

The particulars as to prices charged are, unless otherwise indicated, for Dec. 31, 1924, for English and Welsh undertakings, and May 15, 1924, for Scottish ones. The other information given in the return relates (except where otherwise noted) to the calendar year 1924 in the case of companies' undertakings, and, for local authorities, to the year ended March 31, 1925, for concerns in England and Wales, and the year ended May 15, 1924, for those in Scotland.

The total nominal capital invested in the undertakings dealt with in the return is £168,405,774, including loans borrowed by local authorities and since repaid. This is an increase of £3,195,520 over the amount shown in the previous return. The receipts of the undertakings on revenue account, which amounted to £66,709,990, show a decline of £866,368 when compared with the previous year; and the expenditure, at £57,887,627, is more by £1,293,727. Thus the gross profit is decreased by £2,160,095.

Comparative tables in the return, which are reproduced below, set out separately the financial results for the companies' undertakings and those belonging to local authorities for the whole of Great Britain; in the former case for the years 1920 to 1924, and in the latter for the financial years 1920-21 to 1924-25.

In connection with the companies, the figures in the body of the return for 1924 are further split-up as follows:

England and Wales.—Total capital authorized, £100,243,082; capital and premiums paid-up, £85,278,761; loan capital authorized, £34,457,808; loan capital issued, £22,472,282; revenue account receipts, £44,152,290; expenditure, £38,639,738; profit, £5,515,827; loss, £3275.

Scotland.—Total capital authorized, £310,656; capital paid-up, £259,058; loan capital authorized, £123,491; loan capital issued, £72,625; revenue account receipts, £141,419; expenditure, £116,360; profit, £25,059.

The corresponding figures in the return for the local authorities for 1924-25 are divided-up thus:

England and Wales.—Total amount of loans authorized, £51,720,248; money borrowed, £46,615,274; loans repaid and balance left in sinking fund, £25,489,123; revenue receipts, £17,304,685; expenditure, £15,071,631; gross profit, £2,233,054; interest paid on loans, loans repaid, and amounts paid to sinking funds during the year, £2,250,526; deficit, £17,472.

Scotland.—Total amount of loans authorized, £15,904,809; money borrowed, £13,707,774; loans repaid and balance in sinking fund, £6,257,117; revenue account receipts, £5,111,596; expenditure, £4,059,898; gross profit, £1,051,698; interest paid on loans, amount of loans repaid, and amount placed to sinking fund during the year, £776,151; net profit, £275,547.

In addition to the columns shown in the tables reproduced, the return gives information as to the Special Acts of Parliament and Orders relating to each undertaking, as well as the maximum or standard price of gas per therm, or per 1000 c.ft., as the case may be, and the actual prices charged to prepayment consumers, to ordinary consumers, for power, &c., and for public lamps. There is also a column showing the scale of annual charges for meter rent to private consumers.

COMPARATIVE TABLES.

Companies' Undertakings.

Year.	Number of Authorized Undertakings included in Return.	Total Capital (Share and Stock).		Total Loan Capital, including Debenture Stock.		Revenue Account.		
		Authorized.	Paid-up.	Authorized.	Issued.	Receipts.	Expenditure.	Profit.
		£	£	£	£	£	£	£
1920 . . .	494	98,469,716	82,065,243	29,109,279	18,418,665	53,714,841	49,566,608	4,148,233
1921 . . .	488	99,422,967	83,063,256	32,357,024	21,104,283	51,870,058	47,588,176	4,281,882
1922 . . .	481	100,437,430	83,793,973	33,751,958	22,011,223	46,541,952	39,785,069	6,756,883
1923 . . .	475	100,374,599	84,561,849	33,957,362	22,035,911	44,226,797	37,839,199	6,387,598
1924 . . .	467	100,553,738	85,537,819	34,581,299	22,544,907	44,293,709	38,756,098	5,537,611

Local Authorities' Undertakings.

Year.	Number of Authorized Undertakings included in Return.	Total Amount of Loans Authorized.	Total Amount of Money Borrowed.	Total Amount of Loans Repaid, and Balance in Sinking Fund.	Revenue Account.			Interest paid on Loans, Amount of Loans Repaid, and Amount placed to Sinking Fund during Year.	Net Profit or *Deficit.*
					Receipts.	Expenditure.	Gross Profit.		
		£	£	£	£	£	£	£	£
1920–21 .	304	52,823,504	48,916,008	25,076,806	27,244,570	24,535,685	2,708,885	2,269,573	439,312 profit
1921–22 .	309	60,767,887	53,770,157	26,725,430	26,569,144	25,061,731	1,507,413	2,610,228	*1,102,815 deficit*
1922–23	316	64,519,579	57,123,829	28,616,471	24,084,699	19,414,366	4,670,333	2,901,500	1,768,833 profit
1923–24 .	310	65,533,169	58,612,494	30,027,099	23,349,561	18,754,701	4,594,860	2,965,295	1,629,565 profit
1924–25 .	315	67,625,057	60,323,048	31,746,240	22,416,281	19,131,529	3,284,752	3,026,677	258,075 profit

Leeds University Appeal.—Unfortunately, from the list given on p. 346 of the "JOURNAL" for Feb. 10 of donations and promises received from gas companies and institutions and from manufacturing and contracting firms there was omitted the name of Messrs. Wilsons & Mathiesons, Ltd., of Leeds, who have generously contributed the sum of £500 towards the amount required by the Leeds University.

Manchester District Institution of Gas Engineers.—The 56th annual meeting will be held at the Midland Hotel, Manchester, on Friday, March 5, at 2.30, when the new President (Mr. C. S. Shapley, of Leeds) will deliver his address, which, if time permits, will be open to discussion. The report and accounts, and the reports of Commercial Sections will be submitted; and at the close of the meeting there is to be afternoon tea.

Gas Engine Oils.—Commander Wicks and Lieutenant McCall, in a paper published in the November issue of the "Journal of the American Society of Naval Engineers," advocate the fractional distillation, under a high vacuum, of gas engine oils, both as an excellent acceptance test and as a means of "recovering" used oils. In a note on the paper, "Engineering" says it is stated by the authors that the ordinary acceptance tests are readily passed by mixtures of undesirable light oils with undesirable heavy ones. These mixtures are easily detected by fractional distillation under a high vacuum, which in their experiments, corresponded to an absolute pressure of only 0·1 mm. of mercury. The process has, moreover, been applied by the authors for "recovering" oil from the crank chambers of automobiles and of gas engines. The first distillates to come over are rejected, as are also the last. The "intermediates," which contribute fully 75 p.ct. of the total, have proved to be superior in quality to the oil in its original condition, as it was first fed into the crank chamber.

ORGANIZATION OF THE GAS INDUSTRY.

By J. H. BREARLEY.

The editorial remarks which appeared in the "JOURNAL" for Feb. 3, headed "A Question of Commissioners," are provocative of many reflections; and if they result in co-ordinated attention being paid to the question with which they deal—that of the better organization of the gas industry wherewith to face the future—their purpose will have been well served. It has been put to the writer of these lines that possibly he was the author of the article which appeared in the "Manchester Guardian Commercial Supplement." Lest others should have reached the same conclusion in the game of "hide and seek," let it be said here that he is neither the author, nor aware of the latter's identity. That will sever any individual connection between "Gas Engineer's" contribution and what follows.

It has been discovered that the parochial way in which electricity supply has grown up is all a mistake. That is the only conclusion to be arrived at from the promotion by the Government of a Bill for co-ordination. Precisely the same mistake was made in the establishment of gas undertakings. In the early days of gas supply in the Metropolis, the formation of the Chartered Company was followed by others; but time proved that one gas undertaking in one area was enough, and in later times practice has shown that it is good for areas to coalesce by uniting their distribution systems, and by closing-down the smaller works.

There have been similar experiences, though on a smaller scale, in other parts of the kingdom. When I went to Longwood in 1896, there were four gas concerns (including the statutory one) ministering to the needs of the district, and earlier there had been six. All save one came to financial grief, and that was bought out in 1901. In 1914, the Longwood Company amalgamated with its neighbour Slaithwaite; and in 1919 the combined undertaking was absorbed by the Huddersfield Corporation Gas Department. There have been many experiences on similar lines elsewhere; and it is unquestionable that consolidation carried out in this way is advantageous to the undertakings which are affected, to the consumers they serve, and to the nation. There is nothing wrong with the principle of amalgamation, as shown by the effects wherever it has been applied.

METROPOLITAN AMALGAMATIONS.

In his recent address to the proprietors of the Gas Light and Coke Company, Mr. D. Milne Watson expressed belief in the soundness of the principle of amalgamation, and conviction that it tends to greater efficiency and cheaper gas. No man can speak with greater authority; for not merely is Mr. Milne Watson the Governor of the greatest Gas Company in the world, but he has seen amalgamation widely practised both by his own Company and its neighbours. In the Metropolitan area during the last fifteen years, the separate existence of the following undertakings has ceased: West Ham, Barking, Chigwell, Ilford, Harrow, Richmond, Brentford, Bromley, West Kent, Dartford, Epsom, Mitcham, and Enfield. Harrow and Richmond were absorbed in the bigger Brentford undertaking, and that in turn has recently joined-up with the Gas Light and Coke Company. The output at the date of amalgamation of the various undertakings absorbed by the Gas Light and Coke Company in the last fifteen years has aggregated no less than 9409 million c.ft., or over 37 p.ct. of the output of the absorbing Company as it was in 1909. The South Suburban Gas Company has added by amalgamation 771 millions, the Wandsworth Gas Company 924 millions, and the Tottenham Gas Company 245 millions. If, for the sake of uniformity, we calculate these figures on the 1909 output, the respective percentages of addition are: South Suburban, 52·7; Wandsworth, 78·2; and Tottenham, 15·5.

No one can assert, therefore, that whatever there may be of advantage in the principle of absorption has not been vigorously practised in the Metropolis in recent years. There are still 22 undertakings supplying London and its suburbs; and as there are dints and excrescences where the boundaries meet, it may be assumed that the process of coalescence by amalgamation has not been exhausted. But even as it is, the Metropolis easily forms the most comprehensive illustration of the practical application of the principle of amalgamation.

How has amalgamation in the Metropolis been brought about? Obviously because the men controlling absorbers and absorbed have been business men who could see the wisdom of the step which they were taking, if not in immediate results, at least in ultimate results of all-round benefit. The matter was simplified by the fact that not a single local authority undertaking intervened. Even the 22 undertakings which still exist are all controlled by companies, so that the perplexity of public ownership does not stand in the way of further developments in the same direction, should they be deemed desirable in the common interest.

DIFFICULTIES IN THE PROVINCES.

In the provinces, amalgamation is not so easily achieved. In the first place, without any disrespect, it may be said that enthusiasm for consolidation on these lines has not been so acutely tuned-up by the force of competition which, more than any other element, compels a search for counteracting influences. Cheapness in gas supply, combined with efficiency in service, still counts for a great deal. In looking for sources of cheapening, it is evident that the elimination of gas-works or systems which produce more expensively is bound to come under scrutiny. Even when no basis of this kind can be found for a joining of forces, there is still left the advantage of pooling endeavour, and unified control from a single source, instead of scattered ones. But the biggest stumbling block to unification of the gas industry in the provinces is the mixed ownership. Amalgamation, in many cases, is often wrought by local authorities seeking to extend their borders of municipal government, taking in sundry gas undertakings, not from the primary motive of effecting economies in the supply, but as an incidental in the widening of municipal boundaries. There have been many instances, also, of neighbouring companies joining forces; but, when viewed with the possibilities of amalgamation, these are comparatively rare. Hardly ever does a company acquire the undertaking formerly owned by a local authority, though the Southend case is a conspicuous exception, and Devizes Corporation are reported to be contemplating sale to a company.

The fact is, there is not existing the machinery for "ginger-ing-up" the process of amalgamation in the numerous cases where an independent engineer would say that it would clearly be to the advantage of the respective districts. Process by present methods is too slow, especially in view of the current situation. Some new method of bringing undertakings together must be evolved. It is all to the good that counsel in high quarters says the principle is sound; but this merely leaves matters pretty much as they were. A few undertakings will be guided by the advice, to their local advantage. Many, however, will go on as usual, to the common detriment, for it is now generally recognized that the weak links in the gas industry affect the whole chain.

There are many cases in the kingdom where company undertakings are cheek by jowl with municipal undertakings. Even if the former were prepared to consider purchase by their municipal neighbours, they are unlikely to go "cap in hand" with that proposition. Contrarily, the transfer of a municipal undertaking to a neighbouring company has come to be regarded as unthinkable. Even where a municipal undertaking might be disposed to take-in a neighbouring gas company, it is not unlikely that the municipal authorities in which the company undertaking is situated are jealous of their neighbours, and would resist the proposal to the uttermost, as being the thin edge of total municipal absorption.

A few years ago there was an epidemic of municipal aggrandisement in the West Riding. Many of the bigger towns were seized with a desire for extending their borders. In some cases—Leeds and Bradford, for example—two pairs of eyes were fixed covetously on the same piece of territory. Then the West Riding County Council took alarm at the municipal encroachments on the county area, and became common opponents of all such schemes, which would mean a diminution of county council prestige, not to name a reduction in the rateable value of county areas. How is amalgamation of gas undertakings in these circumstances to be facilitated? Clearly the present position is unsatisfactory, regarded from the aspect of amalgamation being sound in principle.

One way in which amalgamation might be expedited is by county councils following the example of the Lanarkshire County Council, and themselves taking up the rôle of gas administrators. But there has not been the slightest indication south of the Tweed that any other county council had inclinations that way. Even if the inclination prevailed, it would not command general approval. There is a strong body of opinion that believes the public utility services are best administered by private control. We are all familiar with comparisons which have been made which have sought to show how municipal control of gas undertakings is not so mindful of the modern slogan, "Good Service," as is control by companies. However progressive a municipal gas engineer may be, his ideals are often cribbed, cabined, and confined by fear of rousing the antagonism of private interests.

THE QUESTION OF COMMISSIONERS.

"Gas Engineer," in his "Manchester Guardian Commercial Supplement" article, adopted a suggestion which emanated from other quarters—that there should be Gas Commissioners somewhat on the lines of Electricity Commissioners. Therein lies the ground of his offending. Perhaps he was unfortunate in using the word "Commissioner," seeing that the Electricity Commissioners have hardly covered themselves with glory, even when viewed from what the electrical engineers would desire in the way of support in the further extension of their industry. But there does seem to be some link needed between the fruition of amalgamation in the gas industry and the present spasmodic and local way by which it is wrought.

Little fault can be found with Metropolitan conditions; and if all the country was similarly circumstanced, and similarly imbued with the visualization of an ultimate ideal, controversy on the subject could hardly be necessary. But where is the bridge to be found that will span the turbulent stream of mixed company and municipal control?

Nearly seven years ago the writer made the suggestion that a Commission or Committee be appointed to consider how the ideal system of gas manufacture and distribution could be dovetailed into, or substituted for, the present conditions of production and supply; and he asked: "When will a Committee be formed for this purpose?" He further said: "The magnitude of the problems is not greater than the need for radically revising our way of looking at the question of public gas supply and substituting national for local vision." The intervening years have emphasized the call then made for a co-ordinated scrutiny of present conditions in the light of future potency. It does not seem to matter very much whether the Committee or Commission are inaugurated by the gas industry or by a Government ordinance; but that something of the kind supplementary to existing forces working for greater unification of the gas industry is needed, there can hardly be two opinions. As the writer interprets it, a Committee of this kind would be empowered to tender advice in cases of projected local unification, and even to go so far as to take the initiative in making suggestions. They would find a prolific source of such by taking a map of the United Kingdom, dotting thereon the present gas-works ministering to public needs, and noting the frequent promiscuousness of undertakings within a radius of but a few miles.

Upon the question of whether compulsory powers should be sought for, or applied to the problem of, amalgamation, the writer retains an open mind. It would be better to solve the riddle by a voluntary process; but a distinct stumbling-block arises through the indiscriminate mixing of local authority with company undertakings. The immediate point to be considered, apparently, is whether the industry will itself initiate a really comprehensive inquiry into the whole situation. From high quarters there has come the counsel to promote linking-up, and the use, where practicable, of coke oven gas. So long as the matter rests at a mere counsel of opinion, not backed-up by concrete examples of where scope lies for unification, it is, in the writer's view, merely playing round the subject. It would be worth the expenditure of a few thousand pounds to search-out, both generally and individually, the intricacies of the whole problem. If the industry is not ready to face that practical method of approaching the subject, there would seem no ultimate way of bringing about unification but by the establishment of a Government inquiry, by whatever name it might be called.

Parochialism in gas, as in electricity supply, has been referred to as a "mistake." This needs qualification. As the industry grew up, there was either a small individual gas undertaking for a local community, or no gas undertaking at all. The writer has been actively identified in the formation of many such individual cases of provision for local needs. Such schemes as have been projected of making gas at superstations and sending it through many miles of mains at high pressure, or covering the country with a network of "grids" for the supply of rural communities, seem to the writer to be approaching the question at the wrong tangent. The question must be approached from the position of the undertakings as they exist to-day, if the incidence of capital expenditure on revenue-earning capacity is to be kept in proper focus. That is where the Government electricity proposals may easily go astray, biting off more sparsely covered territory than the revenue-earning capacity of the system can reasonably chew.

THE COKE ASPECT.

It must not be overlooked that there is a happy mean between the present apparent superabundance of gas-making stations and the distribution of gas at high pressure from a few mammoth works. In the latter case, many communities would be deprived of local coke supplies, and mulcted in additional costs for carriage of this smokeless fuel. Local undertakings serve the purpose not merely of gas suppliers, but of coke distributors. A true comparison of the relative advantages of gas-making at or near to the pits must, from the national aspect, take into account the additional charges which coke consumers would have to pay to get their supplies from a more distant station. There is good ground for believing that the quality of gas coke will, as a result of the prominence which the subject has attained during the last few months, be greatly improved, and that gas-works will rise to the demand for a satisfactory domestic solid smokeless fuel.

It is no radical uprooting of current practice which the gas industry needs. In the general aspect, its development has followed sound commercial lines. Without departing from that essential base of successful business, much can be done to revise the existing system, providing the undertakings where unification, amalgamation, or extension would be an advantage can overcome the thraldom of the "statutory boundary," and the municipal complications that arise; providing also that there is a will to achieve that end.

BRITISH INDUSTRIES FAIR—LONDON SECTION.

Excellent Display at the White City.

It is two years since the organizers of the British Industries Fair staged an exhibition at the White City; and the present display, which was opened on Feb. 15, is, both in variety and extent, a vast development of the one in 1924. An interesting feature is that all the many halls of the exhibition are heated by gas fires, of which there must be as many as four hundred; and from all points of view the results are admirable. As this year the general public are admitted to the exhibition, these fires will be silent salesmen for the gas industry.

There are one or two exhibits of direct interest to the gas industry. The Gas Light and Coke Company, for example, have a stand on which, in attractive manner, they show tar, creosote, pitch, cresylic acid, phenol, naphthalene, prussian blue, salicylic acid, betanaphthol, pyridine, prussiates of soda and potash, liquid ammonia, toluole, solvent naphtha, and sulphate of ammonia.

The stand of the South Metropolitan Gas Company is more ambitious. This takes the form of a wayside inn—at the "Sign of the Benzene Ring." The timber of the structure is creosoted by the Company's product, and the path leading to the doorway is tarred with their specially prepared road tar. Particular attention is paid to "Metro" disinfectant fluid; and it is of interest to note that this disinfectant is being used exclusively throughout the exhibition. From the points of view of economy and efficiency, "Metro" disinfectant certainly need fear no rival. The Company also exhibit many other bye-products of carbonization; sulphate of ammonia being appropriately demonstrated on a "crazy" pavement, which immediately suggests to the general public its use as a fertilizer.

In the glass section, Townson & Mercer, Ltd., whose laboratory apparatus needs no introduction to readers of the "JOURNAL," have a comprehensive display, among which gas analysis apparatus of various types figure prominently. A new absorption pipette (Stanier's patent) for rapid and accurate estimation of carbon monoxide, for use with the Orsat apparatus, is shown. The construction of the bulb is so arranged that it gives the gas a bubbling contact with the reagent both on entering and on leaving, thus adding greatly to the absorbing efficiency. Those acquainted with the estimation of carbon monoxide by a solution of cuprous chloride know how tedious the operation is, and how difficult it is to obtain complete absorption and be certain of results. The new bulb, it is claimed, takes most of the uncertainty away; and with a fresh solution of cuprous chloride the absorption is completed more quickly. Manipulation is easy, and the gas can be taken into and out of the pipette at a rapid rate without possibility of loss. The firm also demonstrate the Richardson lamp for the estimation of the sulphur contents of the lighter coal tar products. In this apparatus the sulphurous gases are absorbed in a solution of hydrogen peroxide, and oxidized to sulphuric acid, the amount of which may be estimated by direct titration with standard caustic soda solution. It is claimed that the method has many advantages over that in which sodium carbonate solution is used. In the former case, the loss of even 1 c.c. of hydrogen peroxide solution through inefficient trapping will only affect the final estimation to a negligible extent, while in the latter case such a loss may affect the result very seriously. Also, the hydrogen peroxide method involves only one titration. Other items of interest on the stand include a modified Orsat, Hornby's complete gas tester, Somerville's apparatus, and the "Metro-Gas" nitrogen testing apparatus. The latter is a most useful addition to the equipment of any gas-works laboratory.

As for the general exhibits of fine chemicals, pottery, glassware, foodstuffs (a highly popular section), leather goods, wireless, musical instruments, stationery, and many other British industries, all are exceedingly attractive; and that the entire display is being fully appreciated is obvious from the enthusiastic comments of the thousands who visit the exhibition daily. The Fair closes on Friday next, Feb. 26.

GLOVER-WEST VERTICALS.

New Contracts, and Work in Progress.

Several installations of Glover-West vertical retorts have recently been ordered by undertakings in this country and abroad. The Ellesmere Port Urban District Council have placed with West's Gas Improvement Company, Ltd., a contract for the extension of their existing vertical retort plant by the addition of four large "New Model" retorts and a waste-heat recovery plant with Kirke patent induced-draught boiler by Messrs. Spencer-Bonecourt, arranged to take the waste gases from both the old and the new settings. The Romford Gas Company have ordered a further extension of their existing Glover-West plant by the addition of eight retorts.

Piling operations are now actively in progress on the completion of the No. 2 section of the Foleshill Works, Coventry, the inauguration of which was described in our issue for Oct. 31, 1923, p. 313. The existing installation of Glover-West verticals has proved capable of producing 3 million c.ft. of gas per diem, and the extension now ordered will have a daily capacity of 3½ millions. Waste-heat recovery plant is being installed with the new retort bench, and the question of altering the existing plant from natural to induced draught is under consideration.

The Northampton Gas Light Company are now proceeding with the fourth installation, in line with the bench erected in 1920. This bench was the first to be equipped with a West lip-bucket conveyor for handling coal and coke at one and the same time, and without the necessity for a mechanical filler—a device which has proved so successful that few installations of Glover-West verticals are now being erected without it. The Leek Urban District Council have been so satisfied with the installation described in our issue for Feb. 11, 1925, p. 334, and so pressed by the rapid expansion of the demand for gas in their district, that they have now placed a contract with West's Gas Improvement Company, Ltd., for eight additional retorts, with provision for a still further eight retorts, the completion of which will give them plant of a daily capacity of 1¾ million c.ft.

New ground has been broken by the contracts placed by the Buckhaven & Leven (Fife) undertaking, and by the Limerick Corporation (this is the ninth installation of Glover-West verticals in Ireland).

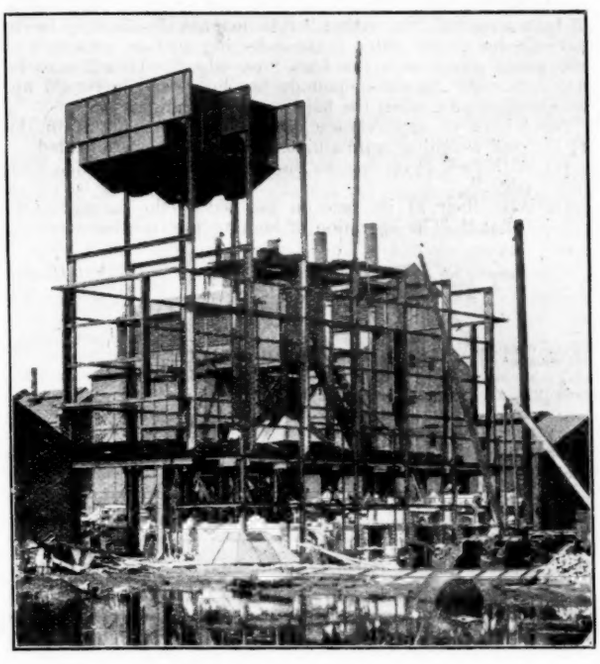
The West Gas Improvement Company of America (Inc.) have secured contracts for Fall River and for Stamford, Connecticut.

Work in Progress.

Installations of Glover-West verticals are being erected in many parts of the world. The plant at the Fulham Station of the Gas Light and Coke Company is standing ready for gas-making, and the large installation at the Nine Elms Station is rapidly approaching completion.

The foundations for the verticals at the new Partington Works of the Manchester Corporation are ready for the commencement of erection. The fifth contract placed by the Leicester Corporation for this type of retort (and the third installation at their Aylestone Road Station) is nearing completion, and work on the installation at Yeovil is in progress. Gas-making has commenced in the new installations at Blackpool, Denny, and Formby in this country, and Fargo in North Dakota, U.S.A.; in the last-named a good make at the calorific value of 525 B.Th.U. is reported. Extensions by way of the substitution of the "New Model" for the old in existing settings are in hand at Liverpool and Macclesfield, among other places, while advantage is being taken of the resetting of the original installation, 1914, at Cardiff to instal waste-heat recovery plant.

Our illustration shows the new installation at Newcastle, New South Wales, with the plant erected in 1912-13 in the background. The installation at Footscray, Victoria, is at a similar stage towards completion. In New Zealand, the plant at Timaru has just been brought into operation, and the extension of the existing installation at Wellington is well in hand. South America is represented by Buenos Aires, where the steelwork of the retort bench is now complete; and the foundations for the installation at Santiago, Chile, are now in progress. In Denmark, the installations at Silkeborg and Copenhagen (Valby) are in a forward state. On the Continent the plant at Prague is proceeding, together with the rest of the plant of the new Michle Gas-Works belonging to the Municipality. Messrs. the Cie. Générale de Construction de Fours also secured the contract in December last for an extension of eight retorts of the installation of Glover-West verticals at Villemomble.



Glover-West Vertical Retorts at Newcastle (N.S.W.).

SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).

Visit to the Oakbank Oil Works.

Members of the Association visited the Oakbank Oil Works of Scottish Oils, Ltd., Mid Calder, on Saturday, Feb. 13. On arrival at the works, they were met by Mr. Spittal (Works Manager), Mr. Hope (Chief Chemist), and other members of the staff, who conducted the party on their tour of inspection.

Process of Oil Production.

The shale is mined some distance from the works, to which it is brought in wagons. It is first passed through a breaking plant, and then elevated by an endless chain to hoppers on the top of the retorts. The hoppers hold a 12-hours' supply.

The top portion of the retort is constructed of metal; the temperature being low at this point. The centre and lower portions are constructed of firebrick. The extractor gear is worked on the same principle as that used in coal gas vertical retorts, in which a long horizontal bar travels backwards and forwards; this being connected by suitable gearing to a pawl acting on a pinion wheel, which is connected to, and revolves, a vertical shaft inside the bottom casting. Horizontal blades are connected to the top of the vertical shaft which cut through the spent shale, prior to its being discharged through conical valves at the bottom.

The process was followed to the oil stills, where the first, second, and third runnings were seen. These runnings are redistilled into their different fractions. Much interest was displayed in the naphtha rectification plant, and in the rectification process of paraffin wax. The crystalline form of the wax was seen in the "sweating" house, where the wax is steamed or "sweated" to remove the oil. The last traces of oil are removed by filter presses, after which the wax is treated to suit customers' requirements regarding different melting-points. The prepared wax is then moulded into blocks for commercial use, or made up in small wrapped cakes for employment in miners' lamps, &c. Refined products were displayed in the laboratory, where explanation was given of the method of recovery and final treatment of all the products.

Following the inspection, the visitors were entertained at tea.

Mr. Alan McG. Clark (President) thanked Mr. Spittal and his assistants for the trouble they had taken to render the visit instructive and enjoyable. He asked Mr. Spittal to convey to the firm the Association's thanks for the hospitality extended, and for the privilege of inspecting the works.

Mr. Spittal, in reply, said he thought that much information could be gained by visiting different works; and he trusted that the Association's inspection that afternoon had proved of value.

TOWN GAS FURNACES FOR HEAT TREATMENT.

[Extract from a paper read by Dr. C. M. Walter, of the Birmingham Corporation Industrial Research Laboratories, before the Association of Drop Forgers on Jan. 21.]

The results of a series of tests carried out some time ago by the author on a direct-fired gas heated furnace, made by Radiation, Ltd., and having a hearth area of approximately 1 sq.ft., are given. From these it will be noted that figures of efficiencies based on the ratio of B.Th.U. usefully employed in heating load to total B.Th.U. supplied, were 23·6 p.ct. in the case of bars arranged with the major surfaces in contact with the bed—*i.e.*, "flat" with the bed—and 31·9 p.ct. in the case of bars arranged "on edge;" this increase of efficiency being entirely due to the extra heat-conducting surface presented to the waste gases with the bars "on edge." It will also be noted that the output in pounds per hour was increased upwards of 20 p.ct. when the bars were so arranged

Steel bars of approximate dimensions 9 in. by 2½ in. by 1¾ in., and weighing approximately 8 lbs. each, were heated:

(1) With their 1¾ in. face on the bed of the furnace—*i.e.*, "on edge."

(2) With their 2½ in. face on the bed of the furnace—*i.e.*, "flat." The operation of heating was continuous—*i.e.*, as bars heated to 975° C. were taken from the furnace, they were replaced by cold bars.

The results of the foregoing tests would appear to show that, provided the operation of heating is continuous, and taking throughput into consideration, the high efficiencies obtainable with small gas-heated forges should justify their use to a much greater extent than at present. The reason why this type has not been more universally adopted may be accounted for, however, by the fact that where gas-heated forges are employed, in many instances, they are not kept working at their full capacity, with the result that the fuel consumption may rise to a figure as high as 6 c.ft. per lb. But, even with a consumption as high as this, it will be found that, with town gas of 485 B.Th.U. gross value, at 2s. 6d. per 1000 c.ft., or (say) 6d. per therm, the actual cost of heating (taking into account incidental charges such as are associated with the use of solid fuel and oil) is about equal to those with the other fuels—this, of course, being due to the increased efficiency obtained in the case of the gas-heated furnace.

Results of Tests carried out on Direct Fired Forge Heated by Town Gas of Gross Calorific Value 495 B Th U. per C.Ft.

Total Weight of Steel raised from 20° C. to 975° C., in Lbs.		Total Gas Used, corrected to 30 in. barometer and 60° Fahr., in C.Ft.			Equivalent Gas Consumption in C.Ft. per Lb. of Steel heated to 975° C. from 20° C.		Heat Transfer Efficiency = B.Th.U. Usefully Employed in Heating Load. / Total B.Th.U. Supplied.		Throughput of Steel, in Lbs. per Hour.	
1st Test. Bars "on Edge."	2nd Test. Bars "Flat."	(*a*) For Heating-up Furnace.	(*b*) For Heating-up Bars "on Edge."	(*c*) For Heating Bars "Flat."	(*a*) Bars "on Edge.'	(*b*) Bars "Flat."	(*a*) Bars "on Edge."	(*b*) Bars "Flat."	(*a*) Bars "on Edge."	(*b*) Bars "Flat."
217·6	306·2	170	436	828	2·00	2·70	31·9	23·6	229	190

LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.

Visit to the Wandsworth Gas-Works.

Well over 150 members of the Association, accompanied by their President, Mr. W. L. Westbrook, visited the Wandsworth Works of the Wandsworth, Wimbledon, and Epsom District Gas Company on Saturday, Feb. 13. No pains had been spared by Mr. C. M. Croft, the Chief Engineer, to make the visit thoroughly interesting; and his efforts were greatly appreciated by all who took part in the inspection.

THE WANDSWORTH WORKS.

Gas was first supplied from these works in 1834. The original site occupied less than one acre; to-day the works cover an area of approximately 26 acres and have over a quarter of a mile frontage on the Thames. The coal requirements are about 300,000 tons per annum; the whole of this being carried by a fleet of specially-constructed colliers owned by the Company. On their trip to Wandsworth, these ships have to pass under the seventeen bridges spanning the Thames from the Tower Bridge to Putney Bridge. The s.s. "Woodcote," the largest of the Company's fleet, carries 1800 tons, and is discharged in eight hours. On an average, the steamers make one return trip every six days. On arrival at Wandsworth, they moor alongside one of the two crane pontoons in midstream, where they are discharged at the rate of over 200 tons an hour into large floating barges of various types. It is of interest to note that two of these, having a capacity of 1200 tons each, are the largest barges at present in use in the British Isles. When full, the barges are floated to the land discharging gear connected with one of three coal stores, where the coal is dealt with by grab cranes discharging into gravity-bucket conveyors capable of filling the stores, trimming the coals as required, or, in case of fire, of removing them from one place to another without manual labour.

REPAIR SHOPS AND POWER HOUSES.

The first item in the tour of inspection on Feb. 13 was the transport repair shop, in which are carried out repairs to the Company's road transport fleet, which consists of about twenty "Foden" steam wagons and trailers, heavy petrol delivery lorries, staff cars, &c. The large transport fleet is primarily used for the transport of coal to the other stations, while the petrol vehicles are employed for the distribution of pipes, stoves, stores, &c. The mechanical repair shop and the brass foundry were next inspected. The former is a large steel-framed building having a floor space of 11,460 sq.ft. At one end is a carpenters' shop fitted with modern wood-working machinery; the other end is devoted to blacksmiths and platers, and is equipped with a power hammer, a gas-fired rivet furnace, and a smoke exhausting plant. The centre portion is taken up with fitters' benches, machine tools, and erecting floor. One gallery contains an electricians' repair shop; the other workshop stores. In the brass foundry, castings of non-ferrous metals can be made up to 100 lbs.

The visitors then passed on to the stove repair shop, where about 5000 pieces of apparatus are dealt with in the course of a year, and the valve room, which contains the governors and boosters required to control the district gas pressure. Here there are two boosters electrically driven, one having a capacity of 500,000 c.ft. an hour, and the other being capable of dealing with 1,000,000 c.ft. per hour with a 14 in. increase in pressure.

There are two power houses. No. 1 contains four units of electrical plant direct-coupled to gas engines of various types, which together are capable of providing power for the works requirements—amounting to approximately 600 horse-power. No. 2 house has two sets of rotary transformers, and is used as a stand-by in case of accident, and is also worked from ten o'clock at night to six o'clock in the morning, and at week-ends.

RETORT HOUSES.

Having examined the breeze-washing plant, which is of the Coulson rotary pattern, and is capable of dealing with all the ashes from the retort-house furnaces, the water gas plant, and the boilers, the visitors inspected No. 4 retort house. This is of the stage floor type, having twelve settings of ten retorts, 24 in. by 18 in. ⌂ section, 23 ft. long. Eight settings are of ordinary-grade moulded sections, two are of 80 p.ct. siliceous grade, and two are of 95 p.ct. silica segmental sections. The stoking machinery is of the Drakes combined charger-discharger type. The coke is removed by a De Brouwer conveyor and is stored in overhead hoppers after being graded by passing up an inclined slope of screens. The capacity of this house is approximately 3 million c.ft. per diem. The combustion chamber temperatures average 2500° Fahr. and the retort temperatures range from 1800° to 2000° Fahr.

No. 2 retort house is similar in capacity, size of settings, and charging machine. The coke is removed by a telpher conveyor and specially-designed skips. The furnaces are charged with a special machine which can also be used for placing hot coke in the adjoining furnace during the periods of stand-by or "warming up."

No. 3 house is the oldest and the largest, having a length of 380 ft. At present it has two benches of twelve settings of ten

retorts; one bench being charged by a De Brouwer machine, and the other by Drakes machinery. The whole of the coke is removed by a De Brouwer hot coke conveyor, and stacked by cranes and skips. The retorts are 21 ft. in length, and of 22 in. by 16 in. ⏀ section in one bench, and 23½ in. by 16½ in. round-bottomed ⏀ section in the other.

WATER GAS PLANT, AND STORAGE.

Then followed an inspection of the water gas plant and the sulphate plant. The former consists of three units having a total capacity of 2,600,000 c.ft. a day, and is complete with all the necessary steam and exhausting plant. The water gas produced (carburetted with 1·8 to 2 gallons of oil per 1000 c.ft.) has a calorific value equal to that of the coal gas—viz., 470 B.Th.U. per c.ft. After leaving a relief holder, it is mixed with the coal gas at the purifier inlet. The sulphate plant consists of a continuous still capable of dealing with the whole of the liquor. There are two saturators of the apron hand-fishing pattern. The next points of interest were the scrubbers and the purifiers. After leaving the exhausters (the exhauster house, by the way, contains four steam-driven units of six exhausters capable of dealing with 430,000 c.ft. an hour), the gas passes through five water scrubbers of the ordinary tower type followed by one large naphthalene washer of the same pattern. All the scrubbers are fitted with specially-designed high-pressure nozzles, by which means the washing liquor is atomized. The purifiers are twelve in number, nine being 40 ft. by 36 ft. by 8 ft. deep cast-iron boxes, and three being of concrete, 48 ft. by 31 ft. 6 in. by 8 ft. deep, all with dry lutes. The gas is then conveyed through the station meters, four in number, each of 1 million c.ft. per hour capacity, and thence to the holders. The latter have a total capacity of 3,500,000 c.ft. The visitors observed the preliminary work which was in progress for a new holder. This will be a four-lift one in a steel tank of 120 ft. diameter. Steel stanchions will compose the guide framing, and the crown framing will be of timber. The area of the foundation is 12,000 sq. ft., and the loading on the concrete will be 0·625 ton per sq. ft. The total weight of the structure, including water, will be 7504 tons, and the capacity 840,000 c.ft. At this stage it may be mentioned that, in order to overcome any temporary increase in back pressure which may occur from an increased volume of gas made or from the condition of the purifiers, an electrically-driven booster is fitted at the outlet of the purifiers, capable of taking the pressure of lifting the holders. The rest of the plant is thus relieved of the equivalent amount of pressure.

VACUUM CONTROL STATION.

The vacuum control station attracted a great deal of attention and favourable comment. This is a feature only recently brought into operation, and has proved an excellent modification of the exhausting system. In this building the gas is continuously regulated for both quantity and quality before being admitted to the exhauster house. The streams of gas from the various retort houses meet in one collecting box, and prior to admission to this box are regulated by "Arca" regulators. The latter constitute a corrective for vacuum; and testing apparatus is provided for each stream, to enable the gas to be tested as it is being made, and the governors regulated as the requirements demand. The gas from the outlet of this box is continuously tested by a recording calorimeter.

Inspection of the fire engine station and the first aid room terminated an itinerary which was of value to all. Members then adjourned to the H. E. Jones Memorial Institute, where tea was provided in the concert hall. Mr. Croft presided.

Mr. WESTBROOK, having expressed his pleasure at seeing such an excellent turn-out of members, said that the visit must have been of great interest to all. He had been particularly impressed by the well-equipped repair shops of the Company, where repairs to the fleet of "Foden" wagons and to the gas-works machinery generally could be carried out. Another item of remarkable interest was the vacuum control station, which, he understood, was the only one of its kind in a gas-works, and certainly appeared to be highly efficient. The Wandsworth Works were extensive, and they had had an opportunity that afternoon of seeing how gas was made on a large scale.

Mr. LEONARD LACEY, Junior Vice-President, proposed a vote of thanks to the Company, to Mr. Croft,, and to the guides—Messrs. E. Rees, U. O. S. Nairne, R. H. Buxton, S. J. Oxer, G. Gardiner, G. B. Duff, and E. Pellew-Harvey. When visiting works of the size of those at Wandsworth, said Mr. Lacey, it was possible to see processes other than that of actual gas-making. As their President had remarked, the repair shops were of great interest. The coal barges, which contained over 1000 tons, were also remarkable. Then there was the vacuum control station. If this worked as successfully as was hoped, Mr. Croft would most decidedly have attained an ideal.

Mr. W. T. KENSHOLE, of Lea Bridge, seconded the vote. He mentioned the fact that the Wandsworth Company sold gas at a very cheap rate. They also took a keen interest in the welfare of their employees. There were five football teams and two or three excellent cricket elevens, the success of which showed that the efficiency which marked the work of the employees was also characteristic of their sport.

Mr. CROFT, on behalf of the Chairman and Directors, replied to the vote. Mr. Jorrocks had said that if there were no differences of opinion there would be no fancy waistcoats. And, said Mr. Croft, if there were no differences in gas-works practice, there would be no need for visits such as had been made by their Association that day. While these differences existed, however, inspection of various works would always be of value, even if it indicated only what not to do. They did not pretend that the Wandsworth Works was a show place; it was essentially a practical concern. They worked hard and they played hard.

Mr. REES, the Assistant Engineer, replied on behalf of the guides. The visit, he said, had afforded them as much pleasure as it had the Association.

SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).

A Meeting of the Western Juniors was held in the Royal Technical College, Glasgow, on Saturday, Feb. 13—Mr. ROBERT GRAY, President, in the chair.

MUNICIPAL GAS UNDERTAKINGS—FINANCE AND ACCOUNTING.

By A. PHILIP, A.I.M.T.A., of Greenock.

[Extracted.]

The accounts, whether of a company or a corporation, are prepared on the double account system, the object of which is to show the total capital expended and the total capital raised for a special purpose, rather than to state, for balance-sheet purposes, the value of the undertaking at any given date. The system is peculiarly applicable to concerns such as gas undertakings, where heavy permanent capital expenditure is involved.

The balance-sheet is composed of two parts—the capital account and the general balance-sheet. This capital account is not a ledger account, but is made up of the capital balances of the several ledger capital accounts in the principal accounting ledger. On the credit side of the account, the capital receipts up to date are stated, and on the debit the capital expenditure. Either the totals of these or the differences are carried to the general balance-sheet. Provision for losses on capital account which might be occasioned by the scrapping of assets or the depreciation of assets not required to be renewed is not provided for under the double account system; and as this under certain conditions is considered financially unsound, it is usually found that any such loss is charged to reserve account and credited to the asset account—being shown generally as a deduction on the debit side of the capital account against the item of expenditure representing the asset. Under the Act of 1920 the Board of Trade may in any Special Order provide for the purchase or redemption out of revenue or otherwise, and for the cancellation of, debenture stock, debentures, mortgages or bonds, or of obsolete or unproductive capital or capital not represented by available assets.

In the case of a municipal gas undertaking, it is usually found that the financial officer controls those accounts which may be said to be synthetical—the financial accounts—as opposed to those controlled by the gas engineer and manager (if any at all), which are analytical, and accordingly of vital interest to him—namely, the cost accounts.

ACCOUNTS OF FINANCE DEPARTMENT.

The principal book of account is the gas ledger. This ledger contains all the accounts, capital and revenue, relating to expenditure, revenues collected, and loans, reserve funds, sinking funds, &c. The accounts contain the record of plant and machinery purchased, the expenses or repairs thereto, salaries and wages of all persons connected with the undertaking, rents, rates, taxes, public lighting expenses, and management and general expenses, including a proportion in respect of the service rendered to the undertaking by the legal and accounting department of the corporation. Total accounts of the revenues are compiled from data supplied by the collecting section of the finance department. All the expenses and revenues are stated in accounts; and it is from these that the data for the annual abstract of accounts are furnished.

A total stores account is invariably kept in the principal accounting ledger linking-up the stores accounting in the works proper. Monthly or other periodical returns of materials consumed, supplied by the gas department, form the basis of charging-up materials used to the expenditure accounts in the principal accounting ledger. This account provides a check on annual stocktaking, and for the proper statement of stores on hand for balance-sheet purposes. The control of expenditure by the finance department is supervisory, dependent in the main, other than in matters of financial policy, upon the certification of the several expenses for payment by the manager

of the undertaking. Particular regard is paid by the finance department to the allocations of expenditure between capital and revenue, as this has an important bearing upon other matters. In the gas collecting section of the finance department, a greater multiplicity of records is found. Here great care is essential to ensure the proper control, receipt, and record of all the moneys due to the undertaking.

Accounts of Gas Department.

The accounts controlled by the engineer and manager are in effect an analysis of the accounts prepared in the finance department; and their efficiency can be readily gauged by the measure of their agreement with the financial accounts. The primary objects of cost accounts in a gas undertaking are the elimination of unnecessary expenditure represented by waste of material and labour, and the disclosure of weaknesses in the operation of the works. The necessity for the control of expenditure is such as to render costing imperative; and to ensure efficiency close co-operation of the financial officer and the engineer and manager is essential.

Working cost accounts have for their object to show the cost of operating, rather than the cost of manufacture—*i.e.*, in addition to prime cost, other direct expenses incidental to manufacture are included (*e.g.*, cartage of coal, and repairs and maintenance of works, plant, machinery, &c.).

The elements of cost are (1) labour, (2) materials, and (3) other expenses—generally termed oncost—and it is in an accurate allocation of these that the foundation of good costing is to be found. To enable the labour costs referring to each job to be accurately allocated, it is essential that a system of time recording by workmen be employed. Allocations to jobs might theoretically be made in a wages abstract, though in practice, where machinery is employed, this is not essential. An accurate record of all materials received, issued, and in stock must be kept.

The other costs comprise administration expenses, rents, rates, &c.; and it depends upon the use to which the costs are to be put whether an allocation of these expenses over manufacture and distribution costs is necessary. For example, in the case of distribution expenses which may be recoverable, total cost—*i.e.*, labour, materials, *plus* oncost—must be ascertained in order that a proper charge for work done may be made.

The cost ledger, which in effect comprises an account for each cost heading, and might be designed to show as charged against these for each week during some period the labour cost and materials cost, is posted from (1) the totals of each column in the wages and materials abstracts (the individual and combined totals under each heading being carried forward from period to period), or where no abstracts are prepared (2) from the individual original documents of record. From the information contained in the cost ledger can be furnished the basis of all the required financial statistics, including, principally, a weekly report of manufacturing costs, invariably reduced to the unit of cost—viz., ton of coal carbonized, or 1000 c.ft. of gas made. The vital point to be kept in view is that costing does not justify itself as regards either the trouble involved or the cost of its ascertainment unless results are produced speedily and with accuracy.

Internal Audit.

The more advanced local authorities and companies have recognized the necessity for a wider scope of audit than a professional or annual audit, and accordingly have instituted what is known as an internal audit, so that, by the detailed investigation which this involves, there may be brought to the attention of the financial officer any weaknesses, duplication, &c., towards the elimination of which suggestions for more efficient and economical processes in recording and accounting matters might be obtained.

Loans—Borrowing and Repayment.

As to the mode of raising capital, local authorities generally obtain their requirements by issue of stock, mortgages, annuities, promissory notes, bills, temporary loans, on simple receipt and bank overdraft; and in the case of the larger local authorities in Scotland, by virtue of Local Acts, sinking fund moneys may be utilized for new capital purposes, in lieu of reborrowing. Town councils have also a general power to apply any sinking fund moneys for temporary purposes. Companies, on the other hand, invariably borrow by the issue of stocks, shares, debentures, mortgages, and by floating loans, bank overdrafts, and the utilization of reserve fund moneys. The main distinction between the borowings of a local authority and a company is that local authorities are required statutorily to provide for the redemption of all their debt.

Methods of Redemption.

To permit of a proper appreciation of how in practice provision for debt redemption is made, it may be pointed out that the instrument of debt is looked upon merely as a means of obtaining funds, and that the currency thereof is not in any way related to the statutory period for redemption—*e.g.*, stock invariably runs for forty or sixty years, and mortgages from three to ten years, whereas the period for redemption in the case of gas loans is statutorily prescribed as being either thirty or forty years. The difficulty is overcome by calculating the provision for debt redemption on the appropriations of borrowings to the specific purposes to which the moneys are applied, which appropriations usually approximate to the actual capital expenditure on these purposes. Loans repayable to lenders upon the instalment or annuity systems are few; and are indeed practically confined to borrowings from the public works loans commissioners. Some local authorities so arrange their borrowings, however, that the statutory provision for redemption calculated on the instalment basis is equivalent to the amount of loans falling due for repayment to lenders each year; and thus, though each loan itself is not repaid to the lenders on the instalment system, as the statutes anticipated should be the case, the borrowings *in toto* are so redeemed. Generally speaking, provision for debt redemption is made according to the sinking fund system—or, rather, an unorthodox version of that system. The actuarial sinking fund calculation is each year based upon the total amount borrowed and appropriated to the end of the previous financial year. In practice, the sum so calculated is charged to revenue, but is not necessarily credited to a sinking fund account. Accordingly, in lieu of the interest which would be earned on the sinking fund contributions, were they separately set aside and invested, a charge is made to revenue in respect of that interest calculated each year on the amount of debt redeemed. Where the total amount of loans repaid to lenders is less than the amount charged as sinking fund provision, then only the excess is considered as a credit to sinking fund. On the other hand, if the total amount repaid to lenders exceeds the charge to revenue in respect of sinking fund (which is unusual), then the excess is met out of capital. These sinking funds, did the law not permit other than that sinking fund moneys should be invested in statutory securities or applied in reduction of debt, would present difficulties of management—*i.e.*, in the finding of suitable investments which each year would give the required amount to be credited to the fund. As it is, the Burgh Police (Scotland) Act, 1903, provides for the utilization for temporary purposes of any sinking fund moneys which a town council may have on hand; and accordingly, where the power is exercised, the gas and all other sinking funds of the corporation readily lose their identity in the general funds of the town council. Thus, paradoxical as it may seem, sinking funds provided for are often non-existent.

Depreciation and Renewals.

A company is, generally speaking, under no obligation to provide for the redemption of its capital, though a municipality providing a similar service, such as the supply of gas, must make provision for the redemption of all its debt. This is important in considering the question of depreciation. Depreciation is defined as the shrinkage in value of an asset from any cause, such as wear and tear, obsolescence, &c., and the main object in providing for this is to keep capital intact. How far provision for repayment of debt by local authorities meets this may be said to depend upon the correspondence between the life of the asset and the period granted for redemption of debt. It is sometimes thought that, provided the loan repayment period does not exceed the life of the asset, any double charge is unnecessary; but then it may be asked, What of obsolescence marching in advance of loan repayments, and what of the effect of equation of loans on short-lived assets?

The methods of providing for depreciation are as follows:

(1) By reducing the book value by an equal annual fixed amount.
(2) By reducing the book value by a fixed amount on the reducing value per annum.
(3) By creating a depreciation fund, and debiting renewals thereto.
(4) By setting aside a sum at fixed periods as a sinking fund, to provide sufficient to replace the asset at the end of its life.
(5) By revaluation of the undertaking.

In determining a method to be employed, regard must be had to the system of account-keeping. This, in the case of gas undertakings, as already stated, is the double account system, according to which repairs, renewals, and replacements are chargeable to revenue as and when they arise. It is evident, however, that if no provision were made in the manner of an equalizing fund for large renewals until they were actually required, the financial position of the undertaking might be seriously affected. It is maintained by some that when accounts are compiled upon the double account system, depreciation cannot logically be made; the fundamental principle thereof being that original assets are maintained out of revenue, and for balance-sheet purposes remain at original cost. This does not conform to good accounting principles, however, as expenditure, whether or not represented by assets, is maintained in the balance-sheet. It is not unusual to find depreciation and/or renewals funds created over a period of years (to which renewals are charged as and when they take place) stated separately as a liability in the balance-sheet (not deducted from the asset), and the investment thereof shown separately as an asset.

A brief discussion ensued, in the course of which Mr. Philip elucidated several further points. The author was heartily thanked on the proposition of the President.

WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.

At the invitation of the Chairman and Directors of the Cardiff Gas Light and Coke Company, members of the Association met at the offices of the Company, Bute Terrace, on Saturday, Feb. 13, for tea, proceeding afterwards to the Better Housing and Housekeeping Exhibition, in the Drill Hall, Dumfries Place.

Mr. B. J. BELL, referring to the propaganda work underlying the exhibition, remarked that the gas industry had nothing to fear from fair competition; but with the prominence given to electricity by the Government, it was essential that they should be fully alive to the necessity of informing the public that the idea that the switch was going to be the means of providing the promised millennium was entirely false, and that the gas industry was in a position to supply a much more efficient and reliable fuel.

A hearty vote of thanks, proposed by Mr. J. WOOD, of Pentre (the President), and seconded by Mr. C. BATEMAN, of Bath (Senior Vice-President), was accorded to the Chairman and Directors of the Gas Company, and to Mr. H. D. Madden (the Engineer and Manager), for the facilities afforded for visiting the exhibition, and the kind hospitality extended to the Association.

THE EXHIBITION.

In the exhibition a very fine show of high-pressure gas lighting is on view; and this must form a great attraction, particularly to the city traders. As may be expected in any exhibition having for its purpose the propagation of better housing and housekeeping, gas may be cited as the predominant partner; and certainly all those connected with the industry, and also the general public, will find a wide range of up-to-date apparatus which should prove highly interesting, and conclusively show that gas still holds the field as the most efficient lighting, heating, and cooking medium for the home.

One of the most attractive stands is that of the Cardiff Gas Company, who, in a fine range of exhibits, display their bye-products. They have on show the utility products of the undertaking; and in an attractive manner the stand has been divided into four sections, one demonstrating the use of solid smokeless fuel and Cardiff gas coke. In an artificial garden surrounding, there is every opportunity of noting the uses to which sulphate of ammonia may be applied as a fertilizer in gardens and allotments, and the value of tar for road and path making and as a wood preservative for outhouses and other buildings. A section is devoted to illustrating the advantages of the carbonization of coal in obtaining the two fuels, gas and gas-coke; while other products, which in the ordinary method of burning are wasted, are conserved. For the domestic use of gas, a large range of appliances is shown, including the most up-to-date labour-saving devices for heating water for baths, &c., and the most economical methods of cooking applicable to present-day building requirements.

Specialist firms devote attention to these particular appliances, such as Messrs. John Wright & Co.; Arden Hill & Co.; the "Nico" Light Company; Falk, Stadelmann, & Co.; Wilsons & Mathiesons; Clark's Syphon Stove Company; the Richmond Gas Stove and Meter Company; the Davis Gas Stove Company; Fletcher, Russell, & Co.; W. H. Dean & Co.; the Parkinson Gas Stove Company; Ewart & Sons; R. & A. Main; the Thermal Syndicate; General Gas Appliances; and Radiation Limited.

MIDLAND JUNIOR GAS ASSOCIATION.

[The chief item at this meeting was a paper by Mr. W. D. Cheshire, of Messrs. Parkinson & Cowan (Gas Meters), Ltd., in which the construction, erection, and testing of station meters of the wet type are dealt with in considerable detail.]

A Meeting of the Association in the Birmingham Council House, on Thursday evening, Feb. 18, was presided over by Mr. J. H. GEE, who congratulated the following members upon their success in passing various examinations in connection with the Education Scheme of the Institution of Gas Engineers:

Gas Engineering—Higher Grade.

Percy, Wm. Hy.	Second class
Sylvester, Frank C.	" "
Wainwright, John Herbt.	" "

Gas Supply—Ordinary Grade.

Hawthorn, S. K.	First class
Harvey, Thos. Alex.	Second class
Atkin, F. L.	" "

STATION METERS: THEIR CONSTRUCTION, ERECTION, AND TESTING.

By W. D. CHESHIRE, of Messrs. Parkinson & Cowan (Gas Meters), Ltd.

My remarks this evening will be confined to the construction, erection, and testing of cylindrical and square pattern meters of the positive wet type only. The various inferential meters now obtainable will not be considered.

As you know, it is usual to speak of the larger meters as having a capacity of so many cubic feet per hour—found, of course, by multiplying the capacity per revolution of the drum by the number of revolutions per hour at which it is designed to work. The normal speed for all sizes up to 3600 c.ft. per hour (or 600 lights) is taken at 120 revs., and above this size at 100 revs., per hour. Similarly, when dealing with lights, 6 c.ft. per hour per light is taken as the basis up to 600 lights, and 5 c.ft. per hour for all larger sizes.

Cylindrical meters usually range in size from 900 c.ft. per hour, or 150 lights, to 50,000 c.ft. per hour, or 10,000 lights; and the square patterns from 10,000 c.ft. per hour to 300,000 c.ft. per hour. The largest cylindrical meter we have made was a 70,000 c.ft. per hour; but that necessitated casting the tank in segments and bolting them together. Of the square pattern we have an order at the present time for a double 300,000 c.ft. per hour—that is, two distinct meters of this size working side by side in the same tank, with a partition separating them; the object of the arrangement being, of course, to reduce cost of production.

We will now consider very briefly the construction and use of the chief parts of a square or cylindrical station meter.

TANK.

The tank of a square pattern meter is made up of internally flanged and ribbed cast-iron plates bolted together. The number and arrangement of plates varies, of course, with the size of the meter. Joints are all planed, and the plates bolted together with cement or red lead. It is most important, when making the joints, to avoid air pockets, or leaks will result from the enclosed air being forced through the jointing material. A common practice is to run two lines of cement—one each side of the bolt holes, with cross pieces near the holes. This is obviously liable to cause pockets of air when the two surfaces meet. One strip of jointing material is sufficient, with curves round the holes, thus: Square-headed ¾-in. bolts and nuts are used 6 in. to 9 in. apart. As a precaution against water leaking through the bolt holes, a hemp grummet is wound round each end of the bolt.

The square meter has a black iron top, built-up on an angle-iron framework. This may be lifted off in sections or in one piece; lifting rings being supplied for the purpose. A manhole is provided and arranged to come directly above the manholes in the drum.

The tank of a cylindrical meter, together with connections, is too well known to need description.

DRUM AND SPOUT.

The measuring drum is cylindrical in shape, having a horizontal axis or shaft of mild steel, by which it is free to revolve on bearings. The drum is divided into three or four equal compartments; the dividing partitions being set at an angle to the axis of the drum. At one end of the drum is the hollow cover forming a convex end to the cylinder. The spout conveying the gas to the separate compartments of the drum passes through the centre opening in this hollow cover, and turns upwards within the cavity between the cover and hoods, or end pieces, of the separate chambers.

Each compartment is open along its whole length at the centre opening, and also there is a gas way leading into, and away from, each chamber. Under working conditions the centre opening is sealed with water. The filling of each chamber with gas causes the drum to revolve and to drive out the gas from the previously filled chamber. As soon as the chamber is filled, and the inlet to it has, by the revolution of the drum, passed beneath the water level, the inlet to the next chamber is unsealed, and so on. After the inlet slit is sealed, the outlet slit opens, and the measured gas is driven out by the water into the meter case and away to the outlet.

Let us now consider the drum in a little more detail. In the first place, the partitions are flat sheets attached to the inside of the drum cylinder along almost its whole length, but at an angle deviating from the axis. The angle at which the partitions are set is determined by the diameter of the centre opening. In fact, the rake is made equal to the diameter of this opening.

From the centre opening is measured the water seal, which prevents gas from passing through unmeasured; and the drum

must be so constructed that the inlets and outlets of each compartment are sealed at the same level. If a drum is drawn in elevation as a circle, and divided into three or four parts, having in each case one part or chamber uppermost, a horizontal line drawn to touch the top of the centre opening gives the seal of the inlet and outlet slits. The hoods belonging to this chamber, respectively at back and front, and joined at one end to the partitions, must at their other extremities be extended—that is, overlap the next chambers—until they come down to this seal line. This overlapping is made in opposite directions, and, together with the chamber, covers, in all, nearly half a circle.

In a 3-partition drum, where the chamber is one-third instead of a quarter of the circle, there is much less overlap. The size of the centre opening, besides determining the rake of the partitions, also affects the extent of the overlap of the hoods of each compartment.

The centre opening of a 4-partition drum may be taken as one-fifth of its diameter, and of a 3-partition as a quarter of the diameter of the drum. The reason for increasing the size of the centre opening in a 3-partition is to reduce still further the overlap and consequent choking of the gas ways. This increase in the size of the centre opening also results in giving the partitions a larger rake, as well as providing a wider passage for the displaced water. In other words, a large centre opening results in (*a*) an increase in rake of partitions; (*b*) a less restricted waterway through the drum, and (*c*) less overlap of hoods. These factors all tend to reduce friction, but, on the other hand, (*a*) a larger proportion of the drum is usually immersed, and also (*b*) water oscillation is somewhat increased. Care must be taken that the centre opening is not too large, causing too high a waterline, as this would, of course, tend to seal at one time any two inlets or outlets that may be uppermost together, it being always essential that one should open before the preceding one is closed.

The advantages claimed for the 3-partition drum are: (1) Economy in construction; (2) less friction in working, due to a reduction in weight; and (3) less resistance to the water, there being only three partitions instead of four.

Capacity Calculation.

In calculating the capacity of a drum, only the space above the waterline during one complete revolution need be considered. If, therefore, we strike a circle to represent the drum diameter, and from the same centre a smaller circle having the height of the waterline as its radius, then the area of the annular space multiplied by the length of the drum will, of course, give the cubic content. In practice it is necessary to deduct a percentage varying with different size drums, to allow for the slope of hoods and the space taken up by partitions, stays, &c.,

It has yet to be settled what length of drum gives the best results. The long drum and the drum of large diameter both have advocates; but in all probability the best compromise is one having a diameter and length approximately the same. The large diameter drum absorbs less pressure, but water oscillation is greatly increased. Should it be necessary to work with a drum of increased length, it is extremely important to provide for increased inlet and outlet spaces.

Drum Construction.

In sizes above 20,000 c.ft. per hour, drums are strengthened by a wrought-iron framework consisting of radial arms, hoops, and flats, with rod and tubular stays. The extent to which framework is necessary, and the most satisfactory way of equalizing and distributing strains and stresses, are best found by experience. The shaft is of mild steel tapering towards the bearings and having two to five cast-iron bosses keyed on, to which the framework is attached.

The drum is constructed of charcoal annealed tinned steel sheets of gauge varying according to size. These are riveted together, and all joints and rivets sweated from the inside with solder. Pure resin is used as the soldering flux. Flat-headed rivets are used for drums up to 10,000 c.ft. per hour, and above this size $\frac{3}{16}$-in. snap-heated, or boilermakers', rivets are preferred.

Riveting is done by two men, the striker and the dolly man. The dolly, which is held up to the rivet on the inside of the drum, has a clear deep hole for drawing the sheets together—known as the draw set—and one half-round depression—called the button set—used for the final blow. Five blows are given to each rivet. The first is to draw the sheets together by means of the draw set, then three riveting blows, and a button set blow to finish.

A manhole is provided for each compartment of the drum, and each manhole plate is fitted with a plug for venting the chambers when the meter is being filled or emptied. When finished, the drum is placed between centres, and tested for balance. Any correction necessary is made by patching with sheet lead. Drums are coated inside and out with a bituminous paint as an additional preservative.

Bearings.

The ends of the drum-shaft are known as journals. These are turned bright, and work in cast-iron bearings bushed with gunmetal. The bearing carrier is called the plummer block. In the square pattern meter the black plummer block is bolted to the spout bracket, and the front one to a bracket behind the index box. Each block has a semi-circular bush of gunmetal capped with a cast-iron retaining cover, drilled in the top for the lubricating pipe. In the cylindrical pattern the bearing consists of a semi-circular cast-iron bearing plate, bushed with gunmetal to a diameter slightly larger than the shaft journals, and bolted to the back plate of the meter. The front bearing consists of a cast-iron handle-shaped projection bolted to the front plate of the meter, and bushed to the required size.

It is important to have a fair amount of shake—say, between $\frac{1}{16}$ in. and $\frac{3}{32}$ in.—in all large meter bearings; otherwise corrosion will soon cause binding.

Index.

The connection from the drum-shaft to the index is made by a countershaft working through a stuffing box. A cast-iron wheel is keyed on the end of the drum-shaft, and drives a similar wheel on the countershaft. An arm is fixed to the other end of the countershaft, and a pin in this arm engages in the fork of the arm that drives the index. In the smaller meters a pin and fork coupling is used in place of the wheels. A short arm with a projecting pin is fixed to the end of the drum-shaft and engages with a forked arm on the countershaft.

The stuffing material consists of felt washers and a tallow mixture, with a leather washer next to the gland. The index includes a tell-tale device for automatically recording the make per hour. This, of course, works in conjunction with the meter clock; a connecting arm, to which a pen is attached, being taken from the minute hand and passed through a fixed guide directly above the centre of the chart. The action of the meter causes the chart to revolve, with the result that each hour is shown as a loop within which the gas consumption may be read at a glance.

Waterline and Overflow.

This enables water to be added when the meter is at work; the surplus running to waste down the swan neck. It is essential that the height of the waterline pipe should represent the correct water level inside the drum. Consequently, inlet pressure must be conveyed to the water in the waterline box. This is done by running a pipe from the meter spout. The water in this box is in direct communication with the tank water, but under inlet pressure, instead of outlet. The waterline itself is made of pure tin tube.

Gauges.

Each meter is supplied with two single-tube pressure gauges to show inlet and outlet pressures respectively. They are placed side by side, so that the difference in pressure representing the loss due to friction in working may be seen at a glance. Tank water feeds both gauges, and the pressure is brought on top of the water columns.

Lubrication.

Stauffer's grease lubricators are now fitted to all square meters and the larger cylindricals. The retaining plates over the bearings are drilled to take the grease pipes; and as there is a good clearance between these plates and the journals, a supply of grease may be kept above the bearings.

Erecting.

We will now consider briefly the erection of a square meter; a good example being a 200,000 c.ft. per hour. The meter must stand on a substantial foundation, which, when finished, should be about 2 ft. below the floor-line. This will allow for a stone plinth to be fitted under the moulding of the meter. The top of the foundation should be smooth and level. The approximate weight of a meter of this size, when complete and filled with water, is about 130 tons. The 250,000 c.ft. per hour weighs about 180 tons.

The twelve bottom plates are all marked with stencilled figures. The method usually adopted in laying these plates in position, so that they bear equally on the foundation, is as follows: Three pieces of $\frac{1}{2}$ in. wrought-iron plate about 12 in. square are placed in the centre of the foundation, to support the corners of the bottom plates. Then all the other corners are packed up with sufficient thickness of plate to make the flanges perfectly level all round. This will leave a space between the plates and the foundation to be filled with cement grout later on, after the lower tier plates have been fixed. The ten lower tier plates can now be fixed and jointed, followed by the two sides and back of the upper tier. To assist in the building-up of the tank, all plates are stencilled, and flanges marked by chisel cuts, which must, of course, be kept lineable.

The outlet connection and blank flange is then fixed, followed by back and side pilasters. These are fastened from the inside of the tank by set screws, washers, and hemp grummets; the hemp being well soaked in red lead paint. The projecting screw ends are then made flush with the body of the pilaster.

Grouting.

Then the space between the bottom of the meter and the foundation is filled-in with cement grout. Holes are drilled in the centre of the tank bottom, and, by a length of $1\frac{1}{2}$ in. barrel with a funnel end, grout may be poured in here as well as from the outside of the tank. To enclose the cement grouting, bricks should be laid on edge all round, and about 2 in. away from, the tank. The whole should be left for at least 24 hours before the bricks are removed. With the exception of the sec-

tion to which the drain cock is connected, the bottom plates are then flooded with cement to the level of the flanges. This leaves a level bottom convenient for cleaning.

FIXING DRUM, &c., IN POSITION.

To get the drum into the tank, a platform of planks should be erected, having five or six lengths of 2-in. barrel underneath, to act as rollers. The drum is lowered on the platform by pulley blocks, and the whole is rolled into the tank. To relieve the periphery of the drum from the weight of the shaft, &c., it is necessary to use timber supports extending from under the bosses to the hoops or outside bands. The drum is then raised, timbers are removed, and the drum is lowered on to some 3-in. planks placed at the bottom of the tank. The front plates and pilasters are next fixed in position. The spout bracket is then inserted through the inlet opening of the back-plate, and fixed by eight set-screws. There are sixteen holes in the flange of this casting; the remaining eight being used for securing the inlet connection and spout in position. The back and front plummer block bearings are now fixed in position, caps removed, and brasses greased.

The drum is then raised, and after the timbers have been removed is lowered on to the bearings. At this stage a spirit level is placed in different positions along the shaft, to check the level. Any adjustment is made at the brackets carrying the plummer blocks. The bearings should be kept hard against the shoulders of the shaft, and journals should line up true with the bosses. The caps of the plummer blocks can then be screwed down, and lubricating pipes fitted. Great care must be taken to avoid dust reaching the bearings. If preferred, the outlet connection, instead of being above, may be level with, the inlet, in which case an outlet box is fixed on the inside of the back-plate, the open end being well above the waterline.

The spout and inlet connections are then fixed. The remaining work includes connecting-up and fixing the index, overflow and pressure pipes, waterline, differential gauges, and filling pipe. Before jointing-on the manhole covers, the drum should be revolved several times, to allow dirt, &c., to work into the tank. The meter roof is then assembled, but this work is not completed until after the meter has been tested. The cornices are now fixed by means of set screws to the top flange of the tank, and the pediment is fixed to the top of the front cornice. After fixing the drain cock, the meter is ready for filling.

FILLING.

It is important, when filling, to make sure that all the plugs in the drum manhole covers are removed, thus venting each chamber. The water should rise until it reaches the centre of the overflow cylinder. Then, after replacing the plugs, the meter is ready for testing.

TESTING DRUM FOR SOUNDNESS AND CAPACITY.

Before testing the drum for capacity, it must first be tried for soundness, to ensure that no gas passes unregistered. The capacity test is usually made at a very slow speed; and if the drum be unsound, that test is of no value whatever. A 100-lt. standard test meter should be used, the method being as follows: A blank flange having a 1½-in. hole is bolted to the inlet of the station meter. A short length of pipe with a 1½-in. T is screwed into this flange, one end of the T being connected to the outlet of the test meter, and the other end fitted with a cock. The gas used for testing passes through the test meter first, and should be at a pressure of not less than 4 in. W.G.

The drum is then scotched while each section is under test. This is done by means of a specially-shaped iron bar inserted through the manhole in the cover. Pressure is allowed to accumulate in the drum until 4 in. is indicated by the gauge on the test meter. The gas supply is then shut off, and the gauge carefully watched for about five minutes; any loss of pressure denoting leakage in either fittings or drum. The pressure is then released by opening the cock on the outlet of the meter; the stop is removed; and the drum allowed to revolve until the next chamber is in position. Then the pressure is raised as before. This procedure is repeated six times in all with a 3-partition, and eight times for a 4-partition, drum, to ensure that every part is perfectly sound.

In order that a reliable test for capacity may be made, it is essential that it should be carried out when atmospheric temperature is fairly constant. One complete revolution of a drum of this size has a capacity of 2000 c.ft., and when under test against a 100-lt. meter occupies nearly four hours. The gas inside is, therefore, liable to be affected very greatly by atmospheric changes, especially should the meter be in the open. It is most important that the rate at which the gas is allowed to pass should not exceed the standard capacity of the test meter. To ensure a complete revolution being made, the body of the drum should be marked by compasses set from a centre dot punched in the cover sheet at the edge of the manhole. A pointer should be placed on the index driving spindle, to denote the progress of the drum.

On completing the capacity test, the tube in the overflow cylinder must be cut-down to the correct waterline, to permit water to overflow gently at the swan-neck while the drum is working under test conditions.

The gauge and waterline scales are then set, the manhole plate of cover screwed-down, and the index, &c., fixed in position.

CAPACITY TEST.

When testing for capacity, the following conditions have always to be considered:

(I.) Temperature at the test meter and the meter under test. This may be the same or different.

(II.) Aqueous vapour. This follows temperature.

(III.) Gas pressure. This is always different.

Of course, the barometer is always the same for both, so no correction is necessary.

The following table shows a simple example of a capacity test of a 200,000 c.ft. per hour meter; one complete revolution of the drum being taken. It will be noticed that the percentage of error is calculated on the test meter reading, since the meter is being tested against that standard. The pressure correction is important, and is added to the test meter reading. By taking $\frac{3}{10}$ in. Hg. pressure as being equal to a 1 p.ct. volume correction, and 4° Fahr. equal to a correction of 1 p.ct. (moist gas), the results approximate closely those obtained by more detailed methods of calculation.

Example of Capacity Test of 200,000 C.Ft per Hour Station Meter.

Station meter		2041
Test meter	1992	
+ ½ p.ct. (pressure correction)	5	1997
Difference		44 c.ft.

Therefore, percentage of error on test meter reading =

$1997 : 44 :: 100 : x$

$= \frac{4400}{1997} =$ . . . . . 2·2 p.ct. fast

Temperature Correction.

Mean between inlet and outlet temperature—

Station meter	65° Fahr.	
Test ,,	59° ,,	
Difference	6° Fahr. =	1·5 p.ct.
(Taking 4° Fahr. = 1 p.ct.)		
Corrected result		0·7 p.ct. fast

Pressure Correction.

Inlet pressure in inches of mercury—

Test meter (3 in. W.G.)	0·22	
Station ,, (2 in. W.G.)	0·15	
Difference	0·07 Hg. =	0·245 or (say) 0·25 p.ct. to be added to test meter reading

The following table shows a test worked out in detail.

Example in Detail of Test of 200,000 C Ft. per Hour Meter.

Test meter reading	(*a*)	1992·0 c.ft.
Station ,, ,, (uncorrected)	(*b*)	2041·0 ,,
Mean between inlet and outlet temperature of test meter	(*a*)	59° Fahr.
Mean between inlet and outlet temperature of station meter	(*b*)	65° ,,
Tension of aqueous vapour in saturated gas at above temperature in inches of mercury	(*a*)	0·50
	(*b*)	0·62
Inlet gauge pressure in inches of mercury	(*a*)	0 22
,, ,, ,, ,, ,, ,,	(*b*)	0·15
Barometer		29 8
Absolute pressure, *less* tension of aqueous vapour	(*a*)	29 52
Barometer and gauge pressure, *less* tension of vapour	(*b*)	29·33
Absolute temperature—(Gases expand 1/492 at 32° Fahr. for every degree. Therefore, Absolute = 460 + any temperature)	(*a*)	519·0
	(*b*)	525·0

Formula for correcting to standard conditions:

$$V \times \frac{60 + 460}{t + 460} \times \frac{P - a}{30{\cdot}00 - 0{\cdot}52} = \text{Corrected vol.}$$

Therefore, substituting above figures

$$= 2041 \times \frac{59 + 460}{65 + 460} \times \frac{29{\cdot}95 - 0{\cdot}62}{30{\cdot}02 - 0{\cdot}5}$$

$$= 2041 \times \frac{519{\cdot}0}{525{\cdot}0} \times \frac{29{\cdot}33}{29\ 52} = 2004{\cdot}7$$

Compared with reading of test meter 1992·0

Difference . . . . . 12·7

12·7 on 1992·0 = 0·64 p.ct. fast.

The usual formula for correcting gases to standard conditions of 60° Fahr. and 30 in. Hg. is employed; but time is saved if, instead of reducing the station meter and test meter readings to standard conditions, the readings of the station meter are corrected to the temperature and pressure of the gas at the test meter. This is done, of course, by substituting the standard conditions referred to in the formula for those of the test meter.

It will be noticed that inlet pressures and mean temperatures have been taken—because, when some tests were made in 1920 at the Saltley Works, Dr. E. W. Smith said "that after various trials it was found that the best approximation of results, obtained in different period tests, was by adopting inlet gauge pressures and the mean between inlet and outlet temperatures." Of course, greater accuracy is to be expected if different period tests are made, and an average taken of the results.

The late Mr. Lacey, of Beckton, once said: "So long as a station meter drum is sound, kept clean, and the waterline maintained, the meter cannot err." Certain parts such as driving wheels, bearings, journals, &c., will obviously de-

teriorate with wear; but when the drum fails, the meter, as such, ceases to exist. It is on record that a drum was placed in a disused gasholder tank, and made to work without any outer casing. A double hollow cover was used, and both inlet and outlet gas communicated by means of spouts. I mention this merely to show that, after all, the essentials of a wet meter are the drum and the water.

Discussion.

The CHAIRMAN congratulated Mr. Cheshire upon the clear way in which he had explained the working of the meter, and the details of its structure. He desired to know what accuracy the author aimed at in checking.

Mr. C. F. TOOBY (Senior Vice-President), moving a vote of thanks to Mr. Cheshire, commented upon the extreme reliability and accuracy, over long periods, of the wet type of station meter. At Coventry they had recently made tests on the six station meters, and it was a matter of satisfaction to report that, though some of them had been working for twenty years, there was only an error of 0·3 p.ct. on one. There were other types—such, for example, as those that depended upon the drop of pressure across an orifice, and the electrical meter—but he did not think they were as accurate as the drum type. It was essential they should ensure that the valves on the meters were sound. It was well, he thought, to have water valves on the meters. The station meter was the piece of plant on gas-works that required least attention.

Mr. W. L. S. SPINKS (who seconded the resolution) said the paper was one of exceptional interest, though he and others had hoped the author might have said more about the difficulties one met with in fixing large cylindrical meters out on the district.* It was surprising how those meters, on the district, went along year after year with practically no attention. They seemed to be a near approach to perpetual motion in the mechanical world.

Mr. E. THRASHER (Birmingham) asked for information as to the correct way to line and level-up a big meter.

Mr. W. J. PICKERING (Nechells), referring to testing, asked what was considered the true pressure of station meters. Should it be the mean between the inlet and the outlet pressure, which were often different when the meter was discharging into the atmosphere; or should it be the inlet pressure only?

Mr. A. KNIGHT (Windsor Street Meter Shops) inquired what difference there would be in registration if, instead of the gas being driven through the hollow crown of the drum—*i.e.*, the accepted inlet—it was driven through the meter in the opposite way.

Mr. L. STURDY (Birmingham) suggested that some device should be put on the meter so that it could be determined whether it was on a dead level.

Mr. H. PERCY (Birmingham) pointed out that, if the water were below the line, the registration of gas was adversely affected. In Birmingham the meters were watered at regular periods, and still the water might be low. Would it not be well to have automatic water supply control fixed to the meters?

Mr. CHESHIRE, replying to points raised, said, as to the checking of temperatures, he felt that often sufficient care was not taken in this matter. Regarding pressures, the practice had always been to take the inlet pressure. As to the difference of registration if the meter was worked back to front, he thought the difference would be slight. The water line must be maintained.

BRITISH INDUSTRIES FAIR—BIRMINGHAM SECTION.

The Midland section of the British Industries Fair at Castle Bromwich, Birmingham, was better supported last week from a buying point of view, both on home and overseas account, than during the first week of any previous Fair. On Saturday last some very encouraging reports were received from stand-holders by the Fair Management Committee; and the consensus of opinion was that business generally had been on a better basis than for several years past. Although a good deal of business has been done in hardware goods made on mass-production principles, it was to be noted that there was this year a better demand for products made according to native specification. A very fair amount of business was recorded by makers of cooking equipment (ordinary fire and gas heated); and everything pointed to the fact of a rapidly increasing use in gas heated industrial furnaces.

FURTHER EXHIBITS.

A closer examination than had been possible up to the time of going to press with last week's "JOURNAL," has revealed the existence in the Birmingham Section of other exhibits which call for mention in addition to those which were noticed on pp. 417-9 of our last issue.

A valve which is acid resistant, and with which 100 p.ct. opening is assured, is the "Merco" plug valve, manufactured by the Audley Engineering Company, Ltd., of Newport, Salop. The underlying patented principle of this valve is the combination in a plug cock of lubricant ducts and a lubricant chamber at the base of the plug. The lubricant ducts and the chamber are so located that, when the lubricating screw is screwed down, the plug is lifted from its seat by an infinitesimal amount, in the same way that the plunger of a hydraulic jack is lifted by the water pressure. The plug is then free to turn. Simultaneously with this lifting and turning of the plug, lubricant is distributed from the grooves over the seating surfaces. The lubricant is renewed by the insertion of a cartridge thereof into the lubricant reservoir in the shank of the plug. A check valve is placed at the base of this reservoir to prevent the grease being forced back when inserting fresh cartridges under pressure. Extreme service conditions seldom require more than two lubricant cartridges per month for a valve under constant operation. A visible lug is cast as an integral part of the gland, and fits into a recess in the plug shank, the two serving as a positive stop in opening or closing the cock. This visible stop clearly indicates to the operator the direction in which to move the plug for opening or closing. A full 100 p.ct. opening in the plug is assured in the "Merco" plug valve owing to its design. Because the bearing surfaces are protected from corrosion by constantly renewed insoluble grease, "Merco" valves of semi-steel or cast iron are now being used in many places where acid-proof alloy valves had been considered necessary. This is particularly true of solutions which, while not strongly corrosive, nevertheless cause pitting and leakage in ordinary valves and plug cocks in a relatively short time. In coke bye-product recovery plants, the valve is in use on air lines handling benzole vapours at 100° to 250° Fahr. In tar distillation it has been found effective on the vacuum lines and on the discharge outlets of the stills.

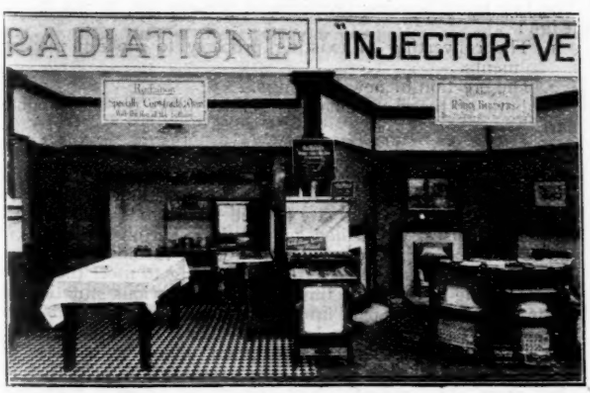
The "Eagle" two-wheel trailer, for Fordson or similar types of tractors, is made by the Eagle Engineering Company, Ltd., of Eagle Works, Warwick, in a number of different designs for the carrying of loads of all kinds. These trailers, with Fordson or like tractors, are claimed to be a most economical proposition, from the point of view both of first outlay and running costs. A pattern designed for carrying large quantities of coal, &c., has been supplied to the Birmingham Corporation Gas Department.

The Gibbons-Van Marle patent machine for charging and discharging industrial furnaces—the sole makers of which are Messrs. Gibbons Bros., Ltd., of Dibdale Works, Dudley—eliminates the waste of time and labour which attends the charging of large muffles and furnaces by hand. The machines are either hand or electrically operated; and the former type is capable of charging furnaces up to 25 ft. in length, and dealing with loads of 2 to 3 tons. The electrically

A COMPREHENSIVE EXHIBIT BY THE BIRMINGHAM GAS DEPARTMENT.

driven machine performs all operations under power from one 4½ H.P. motor—*i.e.*, lifting, charging, and traversing in front of the furnaces. For more than four furnaces, and where current is available, the makers recommend the electrically driven machine. The machine is quite satisfactory for temperatures up to 1100° C. Gibbons' patent gas fired regenerative furnace, for town gas at ordinary pressure, is the outcome of experimental work carried out by the firm with a view to securing increased thermal efficiency. The muffle (which, of course, is heated externally only) will attain a temperature of 1500° C. when working on natural draught and burning 900 c.ft. of 430 B.Th.U. gas an hour. The furnace is really an adaption of the firm's coke producer fired furnaces. Bunsen burners and injectors are entirely eliminated; gas and air being admitted to the combustion chamber by means of suitably-designed fireclay ports. The regenerator (which is of special design) is

Radiation Limited.



Another View of Radiation Exhibit.

utilized to pre-heat air and gas, and is of ample proportions. Particular attention has been paid to the question of insulation. A representative display of Messrs. Gibbons' refractories is also to be found on the stand.

Mr. Silas Hyde, of 99, Snow Hill, Birmingham, makes enamelling, lacquering, and other stoves, fitted with the firm's registered type of air bulb. An exhaustive test has been made with the use of these bulbs by the Birmingham Corporation Gas Department, with the result, it is stated, that a 25 p.ct. reduction in the quantity of gas consumed has been proved.

The Incandescent Heat Company, Ltd., of British Mills, Cornwall Road, Smethwick, display furnaces, pots, malleable iron castings, &c. There is a gas fired natural draught oven and muffle type furnace, suitable for all heat treatment operations. This form of furnace has been developed to a very high degree of efficiency. The temperature may be controlled to within 5° C., and the atmosphere or furnace gases may be similarly controlled to give neutral, reducing, or oxidizing effects, as may be desired. It is stated that useful thermal efficiencies, under favourable conditions, as high as 45 p.ct.

Messrs. Geo. Bray & Co., Ltd.

may be attained. Another furnace shown is the firm's new 1600 " C " type gas fired welding and forging furnace. With this newly evolved furnace, the firm say, they have successfully solved the problem of efficiently and rapidly obtaining and maintaining the high temperatures necessary for welding, forging, and melting heats in a comparatively small furnace. They have installed several of these furnaces with a heating chamber 18 in. wide by 15 in. deep, in which temperatures as high as 1780° C. have been registered with low-pressure gas. When the furnace is working at a chamber temperature of 1600° C., the waste gas exit temperature is approximately only 350° C. Then there is the " Synchroflow " automatic producer gas pressure regulator, which is used in connection with central producers for the supply of gas to furnaces for all purposes, and automatically regulates the rate of gas generation to the demand from the furnaces.

Malleable iron fittings of all sorts and sizes are exhibited by Messrs. J. B. Parkes, Ltd., of Crown Works, Halesowen. They make iron main cocks, both large and small, and with or without brass plugs.

A full range is shown (on the stand of Messrs. William Kenyon & Sons, Ltd.) of the drilling and tapping and pipe cut-

The Parkinson Stove Co., Ltd.

ting machines of Messrs. John Ruscoe & Co., Ltd., of Albion Works, Hyde, Manchester. With these appliances gas and water mains can be drilled under pressure, and connections made, without interfering in any way with supply, and without loss of gas or water. There are also split collars and split socket clips for repairing fractured mains and sockets.

Messrs. Ruston & Hornsby, Ltd., of Lincoln, show their " Thermax " boiler. The special arrangement of tubes, which is a patented feature of this boiler, the firm state, enables them to secure a remarkable degree of economy; the saving, as compared with the ordinary vertical cross-tube boiler, being in the neighbourhood of 20 p.ct. It is particularly well adapted for workshops, laundries, factories, &c. Oil engines, both running and stationary, are shown. Ruston grabbing cranes are in use for handling coal in gas and electricity works.

JOINT MEETING OF THE WALES AND MONMOUTHSHIRE INSTITUTION OF GAS ENGINEERS AND MANAGERS, AND THE SALESMEN'S CIRCLE.

Many members of both organizations attended an extra meeting held under the auspices of the Institution on Thursday last at the Engineers' Institution, Park Place, Cardiff. Mr. H. D. MADDEN, M.Inst.C.E., of Cardiff (President of the Wales and Monmouthshire Institution), took the chair, and was supported on the platform by Major Frank Richmond (London), Mr. James A. Maclay (London), Mr. James Kemp (London), and Mr. W. H. Williams (Cardiff).

The PRESIDENT welcomed the members of firms interested in the "Western Mail" Better Housing and Housekeeping Exhibition, especially on the gas side. He thought that no industry did so much to reduce the housewife's labour as did the gas industry. A good supply of gas was equivalent, from the health point of view, to an abundant supply of pure water. If they had clean water, the spreading of illness and infectious diseases was minimized. Similarly, if they had a cheap and abundant supply of gas, and employed it to the best advantage, the smoke evil was reduced, and the increased sunshine spelt better health.

A NEW SPIRIT IN AN OLD INDUSTRY.

By W. M. MASON, Manager of the "B.C.G.A."

[Mr. Mason said he wanted to divide his address into three sections—(1) gas as a public utility, with reference to its part in the home, in industry, and in the community; (2) service and policy in the gas industry; (3) a personal word to salesmen.]

It is particularly appropriate that we should meet at this time in Cardiff to consider and discuss the position of the century-old gas industry in its present-day place as a public utility. An important and popular exhibition, ably backed by an alert and enlightened Press, is focussing public opinion in South Wales on problems associated with housing and housekeeping; and surely in no sphere of activity does gas service play a greater and more important part. The home is the hub of the universe; and in millions of homes at this very moment gas—the silent servant, the woman's third hand, the indispensable factor in securing economy and efficient service—ministers to the continuous needs of the household.

How true it is that "we never miss the water till the well runs dry." Have you ever stopped to think what Cardiff or London, or Manchester or Birmingham—nay, what any community, large or small—would be like to-day if an insane Government were to forbid the manufacture and sale of town gas? I was interested to read recent reports of the progressive increase and remarkable development of the Cardiff Gas Company. It should be remembered that this steadily increasing popularity of gaseous fuel is being experienced in all parts of the country, in spite of trade depression, and that the national output figures are astounding, not only in their size and scope, but in the manner in which they are multiplied, and are being achieved unaided by State or political backing, and in face of the wide-spread gratuitous publicity being given to our most active competitor. The real reason behind the amazing progress of gas can only rightly be found in the splendid all-round service it renders to the community, and the consistent and persistent educative publicity and salesmanship methods—the Wembley Gas Exhibit was a striking example—which have been inaugurated. The latest available figures prove that practically every family in an area of gas supply is using gas for some purpose. The greatest of all national festivals, the Sunday dinner, is the time when the greatest output of gas is registered. That is a very significant fact.

THE SPIRIT OF SERVICE.

The gas industry, in its co-operative national schemes, as well as in the spirit of service which now permeates its activities, is endeavouring more and more to widen the basis and scope of its work. It recognizes, of course, that by serving the public it is best serving itself; but it is happy in that its work runs parallel with public welfare, and that in pushing its own business it is, at the same time, an important public utility, fulfilling a programme of great value in national and communal affairs.

Here is an extract from an essay recently received by us:

> If a magician had appeared to a housewife of 120 years ago, and said: "Command me, and I will lighten your labour by more than half; most of the dirt shall vanish from your home for evermore, saving dusting, cleaning, and laundry bills. I will give you a steady heat to cook by, that you can regulate at will. Hot water shall flow whenever you desire, even in the night. Fires shall warm your rooms, that come and go at your will, need no attention, and leave no soot and ashes to clean up. I will give you a laundry iron that is a delight to use; light your room with clear, soft light. All this I will do quietly and efficiently, without servants, at the same time saving your health, and giving you time for recreation and enjoyment," it would have seemed like black magic; and yet that is but a part of the daily programme of the gas industry.

The astounding thing about this is that our friends the politicians treat this great public utility much like Cinderella. Let us hope they will all come to realize—as many of them are now beginning to do—that they are putting their money—or, more correctly speaking, have hankerings after putting the ratepayers' money—on the wrong horse.

An interesting illustration of the comparative powers for service of the gas and electricity industries may be found in an old story credited to Lord Rosebery. His Lordship was in a London hatter's, having his "topper" ironed, and while the job was being done, stood in front of the fire in the shop. A pompous youth entered, and, mistaking Rosebery for an attendant, handed his hat to him, and said, superciliously: "Have you anything like that?" Rosebery took the hat, turned it round and round, and, handing it back, said: "No, Sir, and if I had I wouldn't wear the damned thing."

Is it possible to make a brief summary of the virtues and powers for service of the "old hat," as representing our gas industry? The careful and discriminating householder may safely be trusted to judge gas service on its merits. You will find beside or beneath you copies of a tersely worded pamphlet entitled "A National Service in a Nutshell." This indicates how practically the gas industry benefits the housewife, the artisan, the manufacturer, the city, and the nation. Let us glance at it for a moment. It has been well said that "gas offers to effect the impossible, to allow you to 'eat your cake and have it.' It practically permits you to burn your ton of coal twice over, and then slips you a good bonus on the transaction."

[Mr. Mason indicated a number of points in the booklet and emphasized the national and communal service of the industry. He suggested that the booklet and others to which he referred should be extensively used for educative propaganda to counter competition.]

The part that gas plays in coal conservation is, in itself, worthy of the most serious consideration of all interested in the nation's welfare. A carefully reasoned statement on the subject entitled "Facts about Fuel for Heat and Power" is available for those particularly interested.

HOUSING PROBLEMS.

While the essential services given by the gas industry to the householder and the community can hardly be exaggerated, the part played by gas in direct relation to housing questions generally should also be noted; and, with a Housing Exhibition on hand, this seems a suitable opportunity for briefly so doing. The two main housing problems at present are, to my knowledge:

1. The converting of existing property to modern requirements.
2. The erection of new buildings.

In both of these sections gas service plays an outstanding part.

OLD PROPERTY.

The successful adaptation of old property to modern needs is of considerable importance. In London to-day—and doubtless in every important provincial city as well—thousands of large, old-fashioned houses, which had apparently fallen on evil days because of the City's growth or change of fashion, are being converted into flats or offices, and so helping to meet the house famine, while at the same time changing a serious situation on the property owners' part into a sound and even profitable investment. Take instances in the speaker's direct experience. The offices of our Central Association, along with those of kindred organizations, are, at the present time, situated in what were quite recently large six-storey London mansions which have been converted into suites of offices. Whole streets have been, or are being, dealt with in a similar manner.

The clean, easily adaptable, gas fire plays an important part in these conversions, as cleanliness, ease of control, and the elimination, to a great extent, of outside labour are made possible.

HOTEL EQUIPMENT.

Another striking case of profitable conversion is to be found in what is now a large, fashionable, and popular hotel, almost opposite our offices. It occupies the front of practically a whole block, and consists of a series of shops and dwelling-houses linked together, with large public rooms on the ground floor. Incidentally, the bedrooms are fitted with gas fires and automatic meters, so that visitors may have comfort and warmth at a moment's notice, without fuss or trouble, and at considerably less cost than the old method. The saving in labour, as well as the added comfort of the visitors, is remarkable. This system is growingly popular in hotels and boarding houses all over the country, as it helps to lengthen the seasons. Guests now frequently ask if gas fires are available before booking rooms; and many hotel proprietors state in their advertisements that their establishments are thus equipped.

BUSINESS FLATS.

Conversions into modern flats of large old-fashioned houses, the occupation of which the servant problem has made, in many instances, practically impossible, is a similar method that is becoming extremely popular, simply because it is profitable. Here, again, gas service for household needs makes outside domestic help almost unnecessary. The modern business girl, or the business household, is thus largely independent, in a way undreamed-of in the old days. They dine out if and when they wish, for the modern restaurant and popular hotel cater more and more for this class of customer; and they come home when they please, knowing that comfort waits for them by the turning of a tap and the lighting of a match. This is no fancy dream or fairy tale; it is the daily or nightly experience of multitudes in our large cities.

NEW PROPERTY.

The second, and more important, side of this part of our subject refers to new property. In the usual types of dwelling-houses, blocks of offices, or flats and hotels, where gas fires are used instead of the old-fashioned open fireplace, a considerable saving can be effected in building costs by the omission of chimney breasts or chimney stacks. Special flues can be built into the walls to carry-off the products of combustion from these gas stoves. Mr. Edwin J. Sadgrove, when President of the Society of Architects, as far back as 1919, made the following public statement concerning this new system:

> I am prepared to plump with my colleagues, Mr. Swain, the Architect to Messrs. Rowntree, of York, with Mr. John Murray, Architect to His Majesty's Office of Woods and Forests, and with other architects who have given the matter careful consideration, for the abolition of the chimney stack in respect of every room in the house with the exception of the living room.

Liverpool, to mention only one outstanding instance, has given an excellent lead by installing 21,000 "built-in" gas fires with "Economy" flues; the living room being heated by a specially constructed coke grate, which also provides the domestic hot water supply. It has been estimated by architects of wide repute that the saving in building construction per room fitted with a "built-in" gas fire and "Economy" gas flue, as compared with a coal fire and ordinary 9 in. by 9 in. coal fire flue, is approximately £10; and if we, for the sake of forming a conservative estimate, discount this saving by half, it will be seen that in Liverpool alone there has been a saving of at least £105,000 in building construction by carrying out this obvious improvement. At the same time, if the additional floor space made available in the room were capitalized, it would represent a large additional saving. To show what a modest estimate has just been given, the following extract from a letter recently received by us is of interest:

> As a housing expert, . . . my research has led me to the certain value and benefit to be derived by building houses for gas fire arrangements; and I have before me plans with specifications, quantities, and known values for (say) 13 type subsidy houses which show a definite saving in cost of designing for gas fires as against coal fires of £25 per house.

ADVANTAGES.

By the building of a gas fire flue of adequate size in the thickness of the wall, and with no chimney breast projection, the resulting advantages have been well stated as follows:

1.—A reduction in the cost of building the house.
2.—Greater floor space per room on the same ground area.
3.—Greater cubic capacity in the room, thus providing more air or breathing space.
4.—The gas fire would look more artistic, and would be decoratively part of the room, instead of looking like an after-thought.
5.—There would not be two appliances fixed to serve the same purpose.

PALATIAL FLATS.

The service that gas can render in modern buildings is not confined to any particular class, but is applicable to the whole field of building operations. We have been considering houses for tenants of moderate means; let us now turn to the other extreme. You have doubtless read of the demolition of that historical home known as Devonshire House, Piccadilly, to make room for the erection of three large blocks of buildings, comprising high-class shops and palatial flats. The first block of buildings nearing completion is to be known as Devonshire Court, and will accommodate 22 shops, a large restaurant, and 61 flats. The gas installation in this building is both comprehensive and complete, and will include the restaurant equipment, 61 gas cooking stoves, and about 200 gas fires—all ventilating into "Economy" gas flues. This surely demonstrates our claim that present-day gas service is universal in its application to modern buildings. It is, indeed, essential in the new homes of all classes.

THEATRES AND CLUBS.

What is true in the home is also true in other building operations. Take, for example, the latest London West-End Theatre and Club known as the Capitol, recently built in the Haymarket. This, the finest and most luxurious cinematograph theatre in Europe, is capable of seating 2000 people. The building also houses the exclusive Kitcat Club, with its magnificent ballroom and restaurant.

DRAPERY ESTABLISHMENTS.

One of the best-known drapery establishments in the West-End of London has decided to instal gas fired boilers for warming the air to their new buildings. This is effected through the ventilating system. This installation will represent a much larger load than the Capitol Theatre, just referred to. It will comprise three gas-fired tubular boilers fitted in the roof. Each boiler will be connected with a calorifier capable of delivering 3000 B.Th.U. per hour; but it is intended to run only two of the boilers constantly, retaining the third as a permanent stand-by. The total working capacity is 6,000,000 B.Th.U. an hour, which represents a gas consumption of approximately 15,000 c.ft. an hour when full on.

GAS IN TRADE AND INDUSTRY.

Let us now turn to another section of modern gas service—the use of gas in trade and industry. Over 3000 trades in this country, with an average of seven processes in each, are tabulated as now using gas. It is obviously impossible, even if it were practicable, to discuss this section of our subject at length. One typical illustration—gas in the newspaper world—must suffice. Knowing that the newspapers in Cardiff have done much to make a splendid success of the exhibition, I thought this point would be specially appreciated.

At a time when public feeling is being expressed in favour of smoke abatement, it is gratifying to note that proprietors of leading publications are doing everything in their power to assist this movement, not only by devoting much editorial space to educate public opinion on the matter, but also by practising what they preach. By the adaptation of gaseous for raw coal, the valuable bye-products—such as dyes, fuel oils, and a host of other invaluable constituents, as well as coke—are saved for national and industrial purposes. A graphic demonstration of the point is to be seen on the Cardiff Gas Company's stand at the exhibition.

It will be readily realized that the inconvenience and dirt occasioned by the use of coal or coke in such congested areas as are general in and about Fleet Street, or, indeed, in any large city, are not conducive either to efficiency or output. Consequently means have been adopted for the complete elimination of the use of solid fuel. In the past, storage has had to be found for coal or coke; the material has had to be carried to the furnaces; and there have been variations in temperature of the stereotype metal, so that no reliance could be placed on the results to be obtained except in the hands of the most skilled workers, and at great inconvenience. Fires have had to be clinkered and ashes removed, and arrangements made for the storage of ashes and subsequent transit out of town.

GAS IN THE NEWSPAPER WORLD.

For these and other reasons gas has been substituted for solid fuel by the following newspapers and periodicals in London and the Provinces:

London.

"The Times"	"Punch"
"Daily Mail"	"Daily Sketch"
"Daily Mirror"	"Evening Standard"
"Daily Telegraph"	"Sunday Chronicle"
"Daily Chronicle"	"Illustrated Sunday Herald"
"Daily Express"	"Daily Despatch"
"Daily News"	"Sporting Chronicle"
"Morning Post"	"Evening Chronicle"

Provincial.

"Glasgow Herald"	"Leicester Daily Mercury"
"Glasgow Evening News"	"Plymouth Western Mail"
"Western Mail" (Cardiff)	"Manchester Guardian"
"Yorkshire Observer"	"South Wales Argus" (Newport)
"Yorkshire Evening News"	"Bradford Argus"
"Yorkshire Post"	"The Scotsman"
"Nottingham Journal"	"Leeds Daily Chronicle"
"Brighton Herald"	"Northampton Advertiser"
"Hull Daily Mail"	"Blackpool Gazette"

A number of printers producing smaller periodicals also use gas for metal melting.

Gas processes in the printing industry are as follows:

Combined autoplate furnaces and casting machine	Gas heated glue pots
Linotype slug pot	Metal cleaning pots
Linotype machine	Monotype machine
Steam heated presses	Rule casting machine
Matrix dryer	Type casting machine
Patching-up hotplate	Catering

The proprietors of "The Daily Sketch" (London) have recently entirely re-organized their works, and have installed gas equipment for:

Two linotype 7-ton stereo metal melting furnaces	Two 30-cwt. drossing metal pots
Twenty-four linotype machines	Several glue and tea rings
Two matrix dryers	Two tea making boilers
Two steam-heated (gas-fired) matrix presses	Photographic washing tanks
One rule casting machine	Burning-in stoves
	Paint drying cabinet
	Dinner warming oven

Gas has been applied to two "Junior" autoplate machines and to one 30-cwt. "Hoe" furnace, on a completely novel principle. Town gas is taken from the mains, and is induced

into the furnace by means of fan pressure. This has been made possible by the installation of gas firing equipment, designed and installed by specialists with whom the "B.C.G.A." are in close co-operation. By means of this equipment, maximum flame temperatures are achieved at whatever consumption of gas may be employed; consequently the highest thermal efficiencies are attained. This is made possible by the automatic regulation of the proportions of air and gas that are burnt in the furnace. No flames are observable in contact with the pots. The whole of the heating is by means of radiation, so that cracked pots through local heating are unknown—a great improvement over older methods, where cracked pots, costing a great deal of money to renew, were a matter of common occurrence.

Tests which have been carried out on this equipment indicate that, when furnaces are working on full load at the rate of 160 lbs. of stereotype per minute, the gas consumption is only 900 c.ft. an hour, or 1 c.ft. for each 10·6 lbs. of metal melted. Air is delivered to the furnace at underload pressure by three direct-coupled electrically driven fans; and the air piping is so arranged in conjunction with a series of valves that any one fan can be used to supply air to each or all of the furnaces. The furnaces are started by means of a pilot light; and all that is necessary is to open-up one valve, when air and gas are immediately introduced into the furnace under correct conditions, giving the best possible results. The process is compact, clean, and smokeless. When this installation is complete—and only part of the building is as yet finished—it will be one of the most up-to-date and efficient printing installations in the world.

These new developments are of comparatively recent date, having come into being practically within the last three years. The importance and extent of the newer system may be gauged by the fact that the equipment supplied by one furnace maker alone is responsible for an increased consumption of over 100,000,000 c.ft. of gas per annum; and this is only one application.

Very little imagination is needed to visualize what this means in the elimination of smoke and fog, with their attendant influence on public health; and when it is realized that in other important industries, such as those named below, gas is also used to a large extent, as well as in a multitude of smaller businesses, the part played by the industry in practically providing a solution to the smoke problem will be understood.

Aeroplane manufacture	**Lithographers**
Biscuit ,,	**Motor car makers**
Bolt, nut, and screw manufacture	**Needle makers**
	Ore workers
Bottle manufacture	**Paint manufacturers**
Brass foundries	**Pianoforte makers**
Chemists, manufacturing	**Pottery manufacturers**
Cutlers	**Railway locomotive builders**
Cycle manufacturers	**Shipbuilders**
Electric motor manufacturers	**Smelters**
Electrical engineers	**Steel founders and castings manufacturers**
Engineers	
Glass manufacturers	**Tailors**
Hardware ,,	**Tin plate workers**
Ironfounders	**Umbrella manufacturers**
Laundries	**Woollen manufacturers**

For those particularly interested, and for the use of the Press, there are available copies of a comprehensive paper entitled "The Use of Town's Gas in Industry," read by Sir Arthur Duckham at the World Power Conference.

COMPETITION.

I had intended making some comparisons between the super-gas stations and the struggling electricity industry, but it may be more profitable if, instead of painting rosy pictures that might induce complacency on our own part, I endeavour to give you a mental "pick-me-up." You saw, of course, the stirring "Wake-up" call which the Prince of Wales gave British industry this week. Here is stimulating thought in connection with our friends the electricians. I take it from that live and livening publication "The Efficiency Magazine:"

> Don't worry about your competitors. They are the spice of life. They are the zest of business. If it weren't for your competitors, you would be as dead as the Post Office or any other monopoly. If it weren't for your competitors, there would be moss and ivy all over you and your business. If you had no competitors, life would be as flat and stale to you as it is to a clerk in the Board of Trade. There would be no contest, no race, no prizes, no sporting spirit of any kind.
>
> If you are not doing well, don't blame your competitors, blame yourself. You are losing more money by neglect than you are by competition. You are losing more by waste, by lack of team play, by jogging along in a rut.
>
> If your competitors are ahead of you, be a good loser. Don't squeal and make excuses. Play the game harder. Go at it with all the brains you have and all the brains you hire. Don't settle down to be a tail-ender with a grouch. Make up your mind to win. Show your competitors that you're still in the running.
>
> Then, when Christmas comes, you might send a present to every one of your competitors, with a card saying: "Many thanks for having kept me alive during the past year."

No better advice could be given than that recently issued to the industry by the National Gas Council:

> Every undertaking, large or small, whether municipally owned or company, should do everything possible to see that the gas supply in their district is thoroughly efficient, and, thereby, in all ways give satisfaction to their consumers.

The Glasgow Scoutmaster was trying to form some idea as to whether his scouts were carrying out their promise to perform at least one good turn every day. Calling the nearest scout to him, he asked whether he knew of any good turn performed by a member of his troop.

> "Oh yes, Sir," replied the scout. "Sandy McPherson did a good turn this morning."
>
> SCOUTMASTER: "I hope so; what was it?"
>
> SCOUT: "Well, Sir, you know Sandy's old bulldog, don't you?"
>
> SCOUTMASTER: "Yes, I think so. It's the one he usually keeps on a double chain. What about it?"
>
> SCOUT: "Well, Sir, Sandy saw some men running to catch a train, and he thought they would miss it, so he chased them with his bulldog. They caught the train all right, Sir."

The bulldog, or bogey—whatever name best appeals to you—has already had a wonderfully stimulating and awakening effect on the gas industry. With "trump cards" such as I have tried to indicate in its possession, the old industry only needs to "play up and play the game," in the true spirit of service, to continue and develop its power as a public utility.

The second part of the address dealt with the aims and objects of the "B.C.G.A.," and the need for good service—including educative publicity. A special word to salesmen closed the talk.

The PRESIDENT, moving a vote of thanks to Mr. Mason for his able address, said that he had been impressed by the author's spirit of optimism. Certainly there was nothing wrong with the gas industry; and if they continued to work, and to give good service, they would forge ahead in the manner Mr. Mason had indicated. Advertisement by itself, said Mr. Madden, was of little use—it must be backed up by whole-hearted service. He appealed to everyone not at present subscribing to the "B.C.G.A." to go back and get his Board to join issue with the central authority in London. If they took the present exhibition as an example, they would soon realize the value of the "B.C.G.A." In the local papers during the past fortnight, side by side with the advertisements of the Gas Company and the apparatus makers, were large advertisements of the "B.C.G.A." Insistent propaganda was most essential at the present time, when the gas industry was faced by keen competition. The public were beginning to take more interest in smoke abatement; and thanks were due to the "B.C.G.A." for arousing this interest. Appliance makers were showing only first-class goods at the exhibition; and it was up to all gas undertakings to stock nothing but the best.

Mr. J. H. CANNING, O.B.E. (Engineer of the Newport, Mon., Gas Company), seconding the vote, remarked that Mr. Mason had given them an address which bristled with good points. The title of the address was inspiring. He felt that all must cultivate the new spirit of which Mr. Mason had spoken. Mr. Canning joined the President in his appeal for 100 p.ct. membership of the "B.C.G.A."

Mr. ROBERT WEBBER (Managing Director of the "Western Mail") congratulated the gas industry on its evident determination to take its business to the public. This was essential nowadays. The "Western Mail" used gas in forty machines for generating power and heating metal; and they found it the most economical method. Mr. Webber said he was glad of the opportunity of expressing a welcome to the exhibition.

Mr. W. CLARK JACKSON (Neath) said he was sure that the general feeling among them was one of congratulation that they had Mr. Mason with them. Mr. Mason had touched upon the whole of the salient factors that needed to be brought home. "Service" ought to be the slogan of every gas undertaking. Unless they themselves properly understood what service to the consumer really meant, they would always have dissatisfaction. The question of advertisement had also been finely dealt with by Mr. Mason. Exhibitions certainly impressed one with the value of advertising. He did not know how much extra load the present exhibition would bring to the Cardiff Gas Company, but he did know that an exhibition held recently at Neath resulted in one of the heaviest increases for many years. Their turnover of actual business accruing from the exhibition amounted to between £2500 and £3000, which on a small works was a heavy figure. A point which had been stressed was that everyone should subscribe to the "B.C.G.A." It was not fair to take advantage of the "B.C.G.A.," while doing nothing to help.

Mr. R. J. AUCKLAND (Secretary of the Cardiff Gas Light and Coke Company) said they had enjoyed almost a fortnight's good publicity, from which he was sure they would derive a great deal of benefit, not only in Cardiff, but throughout South Wales. He thought he could say nothing better in support of the "B.C.G.A." than that it had never been so easy to sell gas appliances as it was to-day; and this was largely due to the propaganda work of the Association. This work must be supported

Mr. J. E. KENSHOLE proposed a vote of thanks to the South Wales Institution of Engineers for the use of the hall; and this was seconded by Mr. W. CLARK JACKSON.

Those present were then entertained at tea by the firms who were exhibiting at the exhibition—Major Frank Richmond presiding.

Mr. MADDEN proposed, and Mr. J. H. CANNING seconded, a vote of thanks to the firms.

Major RICHMOND, in reply, expressed appreciation of the help which had been given by Mr. Madden and his staff. He would like particularly to mention Mr. Bell, who had been of very great assist-

ance. He was sure that the keenness with which the Cardiff Gas Company had entered into the exhibition would bring good results all round.

Mr. JAMES MACLAY proposed, and Mr. JAMES KEMP (Fletcher, Russell, & Co., Ltd.) seconded, the toast "The Wales and Monmouthshire Institution of Gas Engineers and Managers, and the Visitors."

Mr. J. E. KENSHOLE (Merthyr) replied on behalf of the South Wales and Monmouthshire Institutions. In South Wales, he said, they appreciated that they must give service to their consumers. They realized that a satisfied consumer was the best advertisement they could get. They appreciated greatly what had been done for the industry by the appliance makers.

Mr. T. W. DOCKETT SMITH (Publicity Agent, Cardiff) said he had been most interested in the address and the discussion. His twenty years of study and practice of advertising had shown him that it was a science. He felt sure that the gas industry had set a lead to many others.

Mr. S. C. WHITFIELD (Manchester) proposed the toast "The Cardiff Gas Light and Coke Company." There was, he said, no question as to the service rendered to the public of Cardiff by the Directors and the officials generally. Since 1910 they had increased their main mileage from 211 to 283, their consumers during the same period had increased 47 p.ct., and gas sales had gone up by 63 p.ct. This spoke wonderfully well for the service rendered to the community. They had at present a make of about 2000 million c.ft. per annum, or one-third of the total output of gas in Wales. They supplied nearly 60,000 consumers over an area of 70 sq. miles, and employed about 700 men.

Mr. AUCKLAND, responding, mentioned that last year the Company sold something like 7900 appliances; and he thought they were going to keep up this record. They had about seventy gasfitters who were fully employed.

At the termination of the proceedings, the party visited the exhibition.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Policy—Financial Security.

SIR,—As the industry is to be subjected to State-organized competition, it is natural that the holders of the 100 odd million pounds of capital sunk in the gas companies' concerns should be perturbed.

In so far as the loan or mortgage and preferential stock is concerned, amounting to about 22½ million pounds, under the terms of the Gas Regulation Act this is assured of its full annual return so long as there is any profit earned; and the ordinary stock is similarly protected, so long as gas can be sold at a price that will retain its customers as such. The terms of the Gas Regulation Act provide that the pre-war profits are preserved by adding to pre-war costs of manufacturing any increases arising out of war conditions, &c. Gas stocks therefore appear to be a first-class security, as, in fact, they always have been; and their intrinsic value is influenced by the value of money rather than the internal economy of the industry.

The threatened competition of the electricity proposals is, however, a new factor, which cannot be computed at this stage. It may be no more serious on its broader base than it has been in individual areas in the past; but once an industry is threatened with competition of such a character, it reacts upon its financial status, which simply results in having to pay more for the money employed in its development, to cover the added risk of partial extinction. This occurs with gas just when the industry must be prepared to spend more money in perfecting its services in order to retain, if not extend, its operations. In the case of the municipally-owned undertakings, they are, in a large measure, protected by the capital sinking fund, and to-day have repaid practically £32,000,000 of the total of (say) £60,000,000 sunk in their part of the industry.

Has not the time arrived when gas company interests should apply for a similar privilege? In the face of State-fostered competition, I think a strong case could be made out for it, not only in the interests of present holders of stock, but also to enable the companies to finance their operations on the cheapest possible terms. A sinking fund of 1 p.ct. on the ordinary stock (invested outside the business) would, at compound interest, greatly strengthen the financial status of each individual company, and in a few years' time create such security as probably to equal in effect its cost at the outset. One penny per 1000 c.ft. is approximately equal to 1 p.ct. on the ordinary capital used. An immediate charge of (say) ½d. per therm is not a formidable premium to pay for the substantial financial advantages which such a policy will bring in its train.

W. R. HERRING.

4, *Arundel Street,*
Strand, London, W.C. 2,
Feb. 18, 1926.

Coking of Coals.

SIR,—I have been interested in the abstract of the lecture by Mr. Barash which appeared in the "JOURNAL" for Feb. 3. The question of what causes produce the effect of coking, and what constituents of coal effect coking deleteriously are of sufficient importance to warrant the close examination of any work which has appeared or may in future appear.

I quote from this abstract the following sentence (No. 3, under the sub-heading of "Coking and Agglutinating Power") as being of most importance and interest:

> The so-called "inert matter" exerts a remarkable and hitherto unsuspected influence on the manifestation of agglutinating properties by the cementing material of the coal.

The remarks immediately following show that the author attributes a great amount of importance to this statement.

The "inert matter" in coal is, then, not only the inorganic matter present, but also the "infusible" organic constituents present. With the object of attempting a solution of the action of these bodies, I had commenced a piece of work upon the subject, which, though by no means complete, may be placed on record without delay, as being perhaps worthy of criticism. The following remarks will show my reasons for adopting the method of research stated above.

If coals consist of two main constituents, one highly fusible, the other infusible, then the one will absorb the other during the process of heating in an enclosed vessel. Further, the statement has been made—notably by the late Prof. Lewes—that the coking power of a coal depends to some extent not only upon the proportion of "fusible" constituents present, but upon the "oxygen" content of the coal. It is generally conceded that the fusible or resinous constituents are of fairly uniform composition. This being agreed, it would seem that the "infusible" portion contains the oxygen which may affect the coking power or properties of a given coal.

I therefore prepared a sample of a highly-fusible coal, as free from inorganic matter as possible. I next prepared a series of mixtures of this coal with sand, copper, oxide, and with finely-divided copper. For if the oxygen contained in the infusible bodies is easily liberated on the application of heat, this oxygen will break down, to some extent, the resinous bodies, and thus give a poorer coke and a greater amount of volatile matter. Further, if a poorly coking coal contains a proportionately larger quantity of oxygen, then, on the arguments advanced, very little or no coking power should be exhibited. If, however, the coal be mixed with a substance which will readily take up oxygen, then we might expect, after allowing for the possible effects of the substance acting as an "inert," that the volatile matter evolved would be less, and the coke of better quality. The choice of copper oxide and copper was decided upon because these two substances were readily available in the required physical form, and, further, would answer the purpose.

The following results show the essential figures, obtained to date:

Proximate Analysis of—

	P.Ct.
(1) **Fusible Coal (Dry):**	
Organic volatile matter	34·8
Ash	5·2
Fixed carbon	60·0
(2) **Poor Coking Coal (Dry):**	
Organic volatile matter	45·8
Ash	3·2
Fixed carbon	51·0

(a) Sand-Coal Mixtures (using Coal No. 1).

Sand. P.Ct.	Observed Volatile. P.Ct.	Calculated Volatile. P.Ct.	Divergence. P.Ct.
20	29·0	27·8	1·2
50	18·3	17·4	0·9
75	10·3	8·7	1·6

(b) Copper-Coal Mixtures (using Coal No. 1).

Copper. P.Ct.	Observed Volatile. P.Ct.	Calculated Volatile. P.Ct.	Divergence. P.Ct.
20	29·0	27 8	1·2
50	18·3	17·4	0·9
75	10·3	8·7	1·6

Copper-Oxide-Coal Mixtures (using Coal No. 1).

Copper Oxide. P.Ct.	Observed Volatile. P.Ct.	Calculated Volatile. P.Ct.	Divergence. P.Ct.
20	31·1	27·8	3·3
50	27·1	17·4	9·7
75	19·5	8 7	10·8

The conclusions to be drawn from the above figures are that, with a highly-fusible coal, the oxygen present in the infusible constituent (that constituent being present only in very small quantity) is so small as to be negligible in its action upon the fusible constituents. Copper therefore behaves as a true inert material. Copper oxide, on the other hand, produces some markedly different results. The figures show that the effect of the copper oxide is as was anticipated. This

is further borne out by the fact that metallic copper was detected in the coke buttons of this series, and also by the following figures:

CuO. P.Ct.	Volatile Matter Evolved. P.Ct. on Pure Fuel.
20	38·9
50	54·2
75	78·0
Pure fuel	34·8

In the case of a non-coking or poorly-caking fuel, the following result has been obtained:

Sand Coal Mixture (using Coal No. 2).

Sand. P.Ct.	Observed Volatile. P.Ct.	Calculate Volatile. P.Ct.	Divergence. P.Ct.
20	37·5	36·6	0·9

Copper-Coal Mixture (using Coal No. 2).

Copper. P.Ct.	Observed Volatile. P.Ct.	Calculated Volatile. P.Ct.	Divergence. P.Ct.
20	37·2	36·6	0·6

It will be seen that the normal increase in volatile expelled, for this coal and an inert such as sand, is 0·9 p.ct. The increase when this coal is heated with copper is only 0·6 p.ct.—some 33 p.ct. less. Copper has, then, some inhibiting effect.

It is not to be argued that these results are advanced with any idea of definiteness. The work has not been carried far enough for that; but experiments are being proceeded with in two directions. I should therefore welcome any criticism upon it, as to either its possible value or its unsuitability as a line of approach.

I shall be obliged if you can spare space in your columns for the publication of this communication.

H. N. DANN, Chemist.

Stretford and District Gas Board,
Feb. 13, 1926.

A Cheaper Therm.

SIR,—I have read with great interest the Editorials appearing in your issues for the 10th and 17th inst. As a member of the public, suffering from the high cost of gas, I am delighted to learn that in your opinion a new process is actually available that will materially decrease the cost of gas manufacture.

You point out, however, that the cheapness of the new "L & N" gas is caused by the quantity and value of the oils made by the process. You then proceed to emphasize the point that, before the new process could be universally adopted by the gas industry, *whose duty it is to supply the cheapest therm possible*, the oil position must be set on a secure basis, by the provision of a guaranteed market, and suggest that this could be arrived at by the Government contracting to purchase the oil for the Navy. This would give the Navy its much-needed security for supplies of oil in times of war, and would greatly assist the coal industry by the utilization of cheap slack coals for oil distilling purposes. You also state that the gas industry would be subject to the law of supply and demand in respect of oil. Surely, Sir, gas-works tar, coke, and ammonia come under the above universal law; so oil would be no exception. You strongly hint that the marketability of home-produced oils might be jeopardized by the antagonism of large oil importers, if they wished to strangle the new industry—a risk which gas companies would not care to entertain.

May I suggest, Sir, that your fears, though possibly justified, are mainly groundless. I have discussed the question of home-produced oils with friends holding high positions in the oil world, and they have freely expressed their hope that these oils would eventually be produced. In fact, I have a letter in my possession from one of the largest oil companies, stating that they would be prepared to take all the oils produced, and market same on a profit-sharing or commission basis. This attitude is also supported by another important oil company. Admiral Sir Edmond Slade, K.C.S.I., K.C.V.O., R.N., who I understand is a Director of the Anglo-Persian Oil Company, Ltd., in a paper on "Oil Supplies in War," read before the Royal United Services Institute on Nov. 25, 1925, made the following statements:

> The question of finding a practicable way of exploiting our coal so that we may have a possible source of crude oil in this country is so important from the point of view of securing our position with regard to motor fuel in the event of war, that it is strongly urged that the subject should be carefully considered afresh. The Fuel Research Board are looking into the matter; but progress appears to be very slow, and the urgency of the question does not admit of any avoidable delays, for even if a practicable plant could be evolved to-morrow it would take some years to organize the industry to produce the required oil.
>
> The discovery of a commercially practicable method of dealing with our low-value coals would not only assist in safeguarding our liquid fuel supplies, but would also tend to put the coal industry on a sound basis again. *It would not interfere with the legitimate work of the oil companies, for there is ample room for both.* If desirable, our present refineries could be adapted and enlarged to take the crude oil produced from coal, as and when it is forthcoming. It is suggested that it would pay the Government to offer a substantial bonus—even to the extent of a quarter-of-a-million—for any person or firm coming forward with a process which would satisfy conditions to be laid down, and by which a practicable production of crude oil, of a consistent specification, could be assured at a commercial price.

Therefore, there seems no apparent reason why the big oil companies—especially in view of the anticipated gradual shortage of well oil supplies—should attempt to kill the new home industry. The Government have already pledged themselves to support financially and otherwise this industry. It is inconceivable that any Government would tolerate for a moment any interference by foreign oil interests, in view of the enormous importance of home-produced oils in the Navy, the coal trade, the gas industry (by cheapening the therm), and last, but not least, to the poor unfortunate taxpayer.

I have always maintained that, when a system of distillation such as the "L & N" process has been evolved to produce a *primary* oil, smokeless fuel, and a reasonable amount in therms of gas from a ton of ordinary bituminous coal, its logical development should come from the gas industry, which has every facility for furthering same. I therefore trust that my letter may be reassuring as regards the possible attitude of the oil importing companies, and that the gas industry will not be long in supplying to a long-expectant public the much-needed supplies of cheap gas and smokeless semi-coke.

Your suggestions as to the Government erecting their own plants for the supply of oil to the Navy and bulk gas at cheap rates to gas companies are more intriguing; but why should they not be run as public utility concerns by private enterprise, and finance provided for same under Government guarantee?

G. C. DEW.

Reine Barnes, Dursley,
Feb. 19, 1926.

Buying and Selling Coal and Coke on B.Th.U. Basis.

SIR,—Now that the gas industry has settled-down somewhat to the sale of gas by the therm, has not the time arrived for so modifying the presentation of figures in the various analyses of working results that the B.Th.U. actually put into the process of gas making in the manufacturing plant should be shown, together with the B.Th.U. taken out of such process, and distributed as gas, coke, and tar?

As an example, one gas-works may present a statement showing a yield of 60 therms in gas from a ton of coal; another gas-works, 80 therms per ton of coal. It is possible that the 60 therms may be obtained by better working from the efficiency point of view than in the case of 80 therms. In each instance the therms contained in the coal used should be stated. Some coals represent in potential heat energy 340 therms per ton, others but 250 therms. In making C.W.G., also, the B.Th.U. in the oil used should be given.

Again, it is to be remembered that a year or two ago a very excellent paper was presented to the Institution on the working of a notable works showing the results of straight gas manufacture; the result being 70 therms per ton in a gas of about 560 B.Th.U. In this paper, if I remember rightly, no statement was made as to the C.V. of the coal used, nor (remarkable as it to-day appears) was any question asked about this in the lengthy discussion that took place. It is now well known that all the coals bought by the Company concerned were then, and now are, most carefully analyzed, so that qualities with high moisture or ash content are rejected. This analyzing requires to be adopted generally. Otherwise, in effect one gas-works may be using (say) 22 cwt. of coal charged up to him as 1 ton, compared with another works. Further, in this particular instance, it has since come to knowledge that producer gas was mixed with the straight coal gas "to regulate its density," or to keep a level line in the C.V. of the gas distributed. Obviously the 70 therms was not all straight gas. If Mr. Gill could even to-day give these particulars, they would be extremely helpful to young and progressive engineers who have found it difficult to make 70 therms in the ordinary horizontal practice applied to gas manufacture.

Now as to coke sold, or available for sale. Some returns at present show astounding results as to coke sales. Where does the weight come from? That it is not available in carbon, is evident; and therefore it must be conceded that the "pump" has something to do with it. Is it fair to publish sales of coke without giving the moisture content of it? Here, again, it is notable that those people who sell by the chaldron almost invariably show much better sales per ton of coal than those who sell by weight.

I therefore strongly urge the gas industry, whether they buy their coal on the B.Th.U. contained in it or not, to debit themselves with the B.Th.U. they buy, and to credit the B.Th.U. contained in the coke; and then we shall find something like a basis of comparison for the results obtained, not only in different great cities, but also in our more modest towns and villages—and it will be surprising to me if the latter do not show results equally as good as the former. Heat value, in the form of coal, coke, or tar, cannot be obtained from moisture or ash; and as purvevors of heat we should concern ourselves mainly with the heat value brought into our works and sent out from them.

GEORGE HELPS.

Nuneaton Gas Company,
Feb. 20, 1926.

At the Bradford Police Court, on Feb. 8, Stephen Noble, a labourer employed in unloading a canal barge at the Shipley Gas-works, was charged with stealing 2 cwt. of coal. The police stated that, as a good deal of coal had been missed, a watch was kept, and Noble was seen to fill a sack and a barrow, and wheel it into a dark corner, whence he fetched it later. Noble, pleading "not guilty," said there were no notices to the effect that coal must not be taken. The police record showed that the man had 23 convictions against him, mostly for being drunk and disorderly. The bench imposed a fine of £6, or two months' imprisonment.

REGISTER OF PATENTS.

Manufacture of Water Gas.—No. 231,866.

HUMPHREYS & GLASGOW, LTD., of Victoria Street, S.W. 1
(Assignees of O. B. EVANS, of Philadelphia.)

No. 8629; March 31, 1925. Convention date, April 3, 1924.

The patentees emphasize the fact that the efficiency and capacity of a water gas set depend primarily upon the attainment of a high temperature in the generator. This high temperature can be obtained by excessive blasting, but at the expense of the formation of undesirable clinker; and the use of superheated air and superheated steam for obtaining and maintaining that high temperature presents mechanical difficulties which include the maintenance of valves and grates to withstand that temperature.

By this invention the steam and blast are superheated by the otherwise wasted heat of the products of combustion and of the gas leaving the apparatus. No valves are subjected to high temperature; no hot gases pass through the grate. This permits of the use of a mechanical or stationary grate without requiring water cooling. The high temperature is produced in the body of the fuel bed where the percentage of ash compared with the percentage of carbon is relatively low.

The invention is clear from the claims, which are as follows:

1. The process of making water gas which consists in establishing and maintaining a fuel bed, hot air blasting the fuel bed intermediate of its top and bottom so as to produce a gas making region of high temperature where the ratio of ash to carbon is low, superheated steaming said intermediate region, and leading off the blast gases and the water gas from both the top and bottom of the fuel bed.

2. The modification of the process specified in Claim 1, wherein two separate fuel beds are used and the gases flow from the intermediate gas making region of the one fuel bed to both the top and the bottom thereof, and thence downwardly through the top portion and upwardly through the bottom portion respectively of the other fuel bed, and are led off intermediate of the top and bottom of said other fuel bed.

3. The process of making water gas according to Claim 1 or Claim 2, wherein the blast air and the steam before entering the fuel bed are preheated in a recuperator, and the heat of secondary combustion and the sensible heat of the water gas are stored in another recuperator; comparatively cool combustion products and comparatively cool gas being led off independently.

4. The process of making water gas according to Claim 1 or Claim 2, wherein the blast gas and the water gas are led off from the fuel bed and without passing through the grate.

5. In the process specified in Claim 3, blasting and steaming through the recuperators and the fuel bed first in one direction and then in the other.

6. In the process of making water gas according to Claim 2, introducing secondary air between the tops of two beds of bituminous fuel to burn the volatile matter (and thereby facilitate the carbonization of the raw fuel) and to store heat in the second fuel bed.

Washer-Scrubber.—No. 245,814.

BLAKELEY, J. F., of Howden.

No. 21,552; Sept. 12, 1924.

This invention relates to a washer-scrubber for extracting ammonia and other bye-products which may remain in the gas after passing through prior apparatus. It may also be used for working-up these bye-products for the purpose of extracting benzole or cyanides.

We reproduce a part-sectional elevation of a machine according to the invention.

As shown, the machine is constructed with four washing chambers, each of which is fitted with three rotary brushes mounted on separate shafts, the brushes running in contact with one another and with the wall of the washing chamber. The shafts extend from one end of the machine to the other, and are driven at one end by spur gearing through a form of automatically controlled reversing gear; the arrangement being such that the brushes are compelled to rotate in alternate directions for predetermined periods. [The arrangement is described in detail in the specification.] Situated in front of the washing chambers is a filtering or separating chamber to which is connected a gas inlet pipe communicating with an elbow pipe. The open end of the elbow pipe is perforated (or fitted with a wire-gauge strainer) and surrounded by a comb which dips into liquor; the level of the liquor being controllable. The filter chamber is provided with a valve-controlled drain pipe situated over a trough; and each of the washing chambers also has a valve-controlled drain pipe. The valve in each such pipe may be automatically opened and closed by a time arrangement as described in No. 245,972 [see p. 480]. Interposed between the various chambers are partitions formed with apertures so arranged that the liquid level decreases in height in each succeeding washing chamber. Convenient sight glasses are provided.

Other details are, of course, given in the specification.

Mantles.—No. 245,891.

TERRELL, T., of The Temple, W.C.

No. 27,953; Nov. 21, 1924.

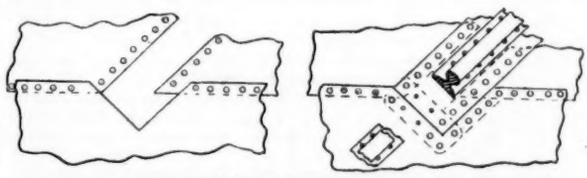
This invention consists in using a lustra cellulose fibre which is made as fine or nearly as fine or even finer than natural cotton—that is to say, from 0·5 denier to 3 deniers silk measurement. The result is a mantle with very slight shrinkage and great strength. Being solid in the structure of its fibres it possesses all the advantages of artificial silk and at the same time all the advantages of cotton fibre without the disadvantages due to its tubular forms. This very fine lustra cellulose fibre may be made in short lengths and may be spun in exactly the same way as cotton.

Side Sheeting of Spiral Gasholders.—No. 246,090.

DEMPSTER, LTD., R. & J., and SCOTT, J. W., both of Manchester.

No. 30,261; Dec. 1, 1925.

This invention relates to the side sheeting of spiral-guided gasholders, and forms an improvement on the means described in specification No. 206,791 [see "JOURNAL," Vol. 164, p. 842], wherein either or both of the top and bottom thickened tiers and plates are provided with diagonally extended or widened parts, for making butt joint with a base plate for each spiral rail; the base plate covering a diagonal gap in the ordinary sheeting between the top and bottom tiers. In this way, the continuity of the top and bottom plates is not broken all round the holder, and there is obviated a difference of thickness or "step down" effect between the plates concerned. In practice, however, it has been found that in forming the widened or



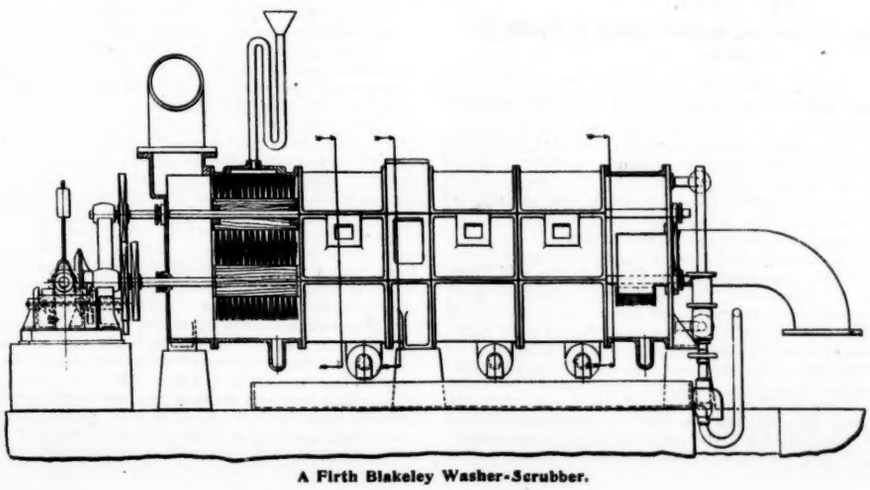
Economy in Spiral-Guided Holders.—Messrs. R. & J. Dempster.

extended parts of the plates from the sheets as originally rolled, there is considered waste of material on either side of the extended part. Especially is this so in view of the excessive thickness of plate now required for the top and bottom tiers under modern conditions of gasholder construction.

The object of this invention is to attain, practically, the advantages already referred to, without having to widen or extend the sheets, and therefore without having to incur an excessive waste of material.

Accordingly, in place of an extension of the plate concerned, the same is given a limited diagonal or oblique gap, sufficient only to enable a proper connection with the base plate to be obtained. The area of material removed is insignificant; and there is added resistance to side thrust at the joint.

The arrangement will be understood from the side views of the cut sheets and the plating.



A Firth Blakeley Washer-Scrubber.

Control Apparatus for Valves, &c.—No. 245,972.

BLAKELEY, J. F., of Howden, and NUNWICK, W., of Huddersfield.

No. 7020; March 16, 1925.

This invention relates to control apparatus for valves, taps, and the like, and has for its chief object to introduce a simple and efficient form of apparatus which will intermittently and automatically open one or more taps at predetermined periods, keep them open for predetermined periods, and then automatically close them. The invention is applicable by way of example to the draw-off taps of a gas washing and scrubbing machine which forms the subject of specification No. 245,814 [see *ante*].

The patentees claim: Control apparatus for valves, taps, and the like wherein a wheel which makes one revolution in a predetermined period disengages one or more catches from a slidable bar which then disengages a projection on a mutilated toothed wheel and allows the latter to receive one revolution from a continuously rotating wheel to cause a tappet or crank to engage a cam surface on the slidable bar and impart a reciprocating movement to the latter to open and close the valves or taps.

Control apparatus according to the preceding claim wherein the slidable bar or a rod connected therewith carries one or more slotted arms adjustably connected with slotted arms on the tap or valve spindles.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Feb. 10.]

Nos. 2783-3483.

BROWN, J. T.—"Retort-house governors." No. 3020.
BUBE, K.—"Treatment of distillation products from bituminous materials." No. 3160.
DEMPSTER & SONS, LTD., R.—"Apparatus for handling coke." No. 2032.
DENT & HELLYER, LTD.—"Control means for geysers, &c." No. 3349.
FAIRWEATHER, H. G. C. (URBANA COKE CORPORATION).—"Process of coking coal." No. 2894.
FAIRWEATHER, H. G. C. (URBANA COKE CORPORATION).—"Coking coal." No. 3039.
HARRISON, A.—"Gas lighter for solid fuel stoves." No. 3236.
HELLYER, R. H.—See Dent & Hellyer, Ltd. No. 3349.
HOLTON, A. L.—See Brown, J. T. No. 3020.
HOWGATE, A.—"Apparatus for manufacture of coal gas, &c." No. 3090.
KEITH, G.—"Art of firing gas furnaces." No. 3365.
KEITH & BLACKMAN CO., LTD., J.—See Keith, G. No. 3365.
OWENS, J. S.—"Open grate for burning coke." No. 3441.
POWER-GAS CORPORATION, LTD.—"Production of mixed gas from bituminous fuel, and recovery of bye-products." No. 3152.
RAMBUSH, N. E.—See Power-Gas Corporation, Ltd. No. 3152.
SMITH, N. S.—See Harrison, A. No. 3236.
TOOGOOD, H. J.—See Dempster & Sons, Ltd., R. No. 2032.
URBANA COKE CORPORATION.—See Fairweather, H. G. C. No. 2894.
URBANA COKE CORPORATION.—See Fairweather, H. G. C. No. 3039.
WILKES, A. H.—"Gas and air injector for gas furnaces, &c." No. 3081.

[Extracted from the "Official Journal" for Feb. 17.]

Nos. 3484-4212.

ALEXANDER, H.—"Gas cooking apparatus." No. 3791.
CANNON IRON FOUNDRIES, LTD.—"Gas burners." No. 3969.
CHAVANNE, L.—"Gasification of solid fuels." No. 3882.
DAVIDSON, T. M.—"Gas generators." No. 4122.
HAWTHORNE, H. S.—See Cannon Iron Foundries, Ltd. No. 3969.
MAGEE, J.—See Alexander, H. No. 3791.
PATENT RETORTS, LTD.—See Davidson, T. M. No. 4122.
TRENT, W. E.—"Carbonizing processes." No. 3573.
TULLY, S. J. B.—"Apparatus for manufacture of carburetted water gas." No. 3516.
VICTAULIC CO., LTD.—"Pipe connections." No. 3838.
VICTAULIC CO., LTD.—"Pipe joints." No. 4088.
WARD, E.—"Gas geysers." No. 4128.
WINKLER, A.—"Gas producers." No. 3835.
YEO, O. E.—See Tully, S. J. B. No. 3516.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Chorley Corporation Bill, Darwen Corporation Bill, London County Council (General Powers) Bill, and the Halifax Corporation Bill: Read a second time.

Petitions Against Private Bills.

Petitions have been deposited by the Friern Barnet Urban District Council and the Middlesex County Council against the Barnet District Gas and Water Bill; and by the Eastbourne Gas Company against the Eastbourne Corporation Bill. The Lea Bridge District Gas Company are petitioners against the Walthamstow Urban District Council Bill.

Special Orders.

The Bedford District Gas Order, 1926, has been referred to the Special Orders Committee.

HOUSE OF COMMONS.

Gas Regulation Act.

A copy was presented of a draft of a Special Order proposed to be made by the Board of Trade under the Act, on the application of the Bedford District Gas Company.

WEIGHTS AND MEASURES (AMENDMENT) BILL.

The Marquess of Salisbury has introduced a Bill into the House of Lords to amend the Weights and Measures Act of 1889. Owing to the terms in which the expression "measuring instrument" is defined by section 35 of the 1889 Act, the provisions of the Weights and Measures Acts relating to measuring instruments do not extend to instruments for measurement by counting or (except in the case of instruments for measuring leather and patterns thereof) for the measuring of superficial area. This defect is to be remedied by clause 1 of the present Bill. Provision is made by the existing Acts for the control of weights, measures, and weighing instruments used for trade—*e.g.*, by section 29 of the Act of 1878 as extended by section 1 of the Act of 1889 penalties are imposed for the use of weights, measures, and weighing instruments which have not been stamped as the Acts require; but there is no similar provision with respect to measuring instruments. Clause 2 of the present Bill makes provision for bringing within the scope of the Acts such measuring instruments as the Board of Trade may specify by regulations which must be laid before Parliament. Clause 3 of the Bill provides for the removal of doubts which have arisen whether the fees allowed under the Weights and Measures Acts and the Fees (Increase) Act, 1923, for the testing, &c., of weighing or measuring apparatus may be charged where the apparatus submitted fails to pass the test.

MISCELLANEOUS NEWS.

COKE FIRES.

Experiments of Dr. H. Osborne, Medical Officer of Health for Salford.

In an interview with the "Manchester Guardian," Dr. H. Osborne said that it was true that the all-firebrick grates experimented with were not in very common use. "However," he said, "it is a comparatively easy and inexpensive matter to convert existing grates to this type, in which, by the way, there is complete absence of metal in construction, and no bottom draught whatever. The potentialities of vertical dry coke when burned in the all-firebrick well grate have been hitherto little known. The surprisingly good results and the considerable economy effected deserve the widest publicity."

Emphasis was laid on the fact that these fires do not require more attention than the ordinary coal fire, though, Dr. Osborne said, they do require rather different attention. "The lighting is quite an easy matter if the correct method is adopted, and the same may be said of maintenance. Having taken out the ashes, a layer of the previous day's cinders is left on the firebrick hearth. Paper and chips are laid on this, together with a few pieces of dry coke. After these become ignited, the fire is built vertically, using the larger pieces of coke towards the front, and the smaller pieces behind. It is not advisable to have the coke broken up too small, as then the penetration of air is impeded, and a dull fire results. The poker is only required when the fire is getting low, to raise the hot cinders above the ash, which falls into the bed; fresh fuel is then built over the glowing cinders, and this quickly becomes incandescent."

Dr. Osborne declared that one of the striking features of the fires is the rapidity with which they attain their maximum radiant efficiency. As compared with coal, he says, the coke fires begin to warm the room much more quickly, and the heat radiation is maintained at a high level for prolonged periods.

"The experiments," he went on, "seemed to show that, as compared with coal, a much greater proportion of the total heat of combustion is radiated into the room. This is proved by the fact that though, weight for weight, the thermal value of the coal used (13,494 B.Th.U.) was somewhat greater than that of the coke (13,151 B.Th.U.), yet the weight of coal required to produce the same heating effect in the room was 50 p.ct. more than the weight of coke. It is easy so to build these fires that the maximum intensity of radiation from the glowing surface is directed almost horizontally across the room, instead of almost vertically towards the ceiling, and so wasted, as obtains with other fires.

"A noteworthy property of the vertical dry coke used in the experiments is the absence of 'flying' and 'crackling' which are sometimes experienced when certain other cokes are burned, and which may be due to excess of water. It is as well to note that ordinary coke, which has been copiously quenched with water at the gas-works, will not burn freely in open grates. To obtain the best results with coke fires, attention to details, already hinted at, is necessary."

The Medical Officer is willing to give demonstrations,

COMMERCIAL GAS COMPANY.

Annual Ordinary Meeting.

The Annual Ordinary Meeting of the Company was held last Thursday, at the Cannon Street Hotel, E.C.—Mr. W. G. BRADSHAW, C.B.E. (the Chairman), presiding.

The GENERAL MANAGER AND SECRETARY (Mr. F. J. Bradfield) read the notice convening the meeting; and the Directors report and the statement of accounts were taken as read.

THE LATE MR. H. E. JONES.

The CHAIRMAN, on rising to address the proprietors, said: I much regret that the first matter which I have to mention to-day is the great loss which the Company has sustained in the deaths of our old friends and colleagues Mr. H. E. Jones and Mr. H. D. Ellis, to both of whom the shareholders owe a debt of gratitude for their long and eminent services. Mr. H. E. Jones was connected with the Company, first as Engineer and afterwards as Director and Deputy-Chairman, for 56 years; but his interest in the gas industry was longer still, for he began his career in it in the year 1862, which is over 63 years ago. He joined the Ratcliff Company in 1869; and when that Company was absorbed by the Commercial Company in 1875, he was appointed Joint Engineer with his father, the late Mr. Robert Jones, and became Chief Engineer and General Manager on the retirement of his father in 1880. In 1902, he resigned that position, and was at once elected to a seat upon the Board, subsequently becoming Deputy-Chairman. To him more than to anybody else the Company owes its long career of unbroken prosperity. His ability as an engineer, his skill as an administrator, and the wisdom with which he managed its affairs during the 27 years in which he was Chief Engineer and General Manager, contributed more than anything else to the position which the Company held in the gas industry. In a word, his services to the Company cannot be over stated, and his loss is in many senses of the word irreparable. He also occupied by universal consent a place in the foremost rank of his profession—attaining in 1917 to the proud position of President of the Institution of Civil Engineers; the first gas engineer, I believe, to be so distinguished. If I may be allowed a personal reference, my father and I were associated with him in this and other institutions for no less a period than half-a-century—viz., from 1875 to 1925—and during the whole of that time our friendship was never once marred by the shadow of a single disagreement or misunderstanding. He passed away quite suddenly, as I think he would have chosen, on the 24th of March last, at the ripe age of 82 in the full possession of his mental and physical powers. It will be long before we see his equal; and not one of us who knew him will ever cease to mourn his departure from us.

MR. H. D. ELLIS'S DEATH.

Mr. Ellis died on the 14th of October last year, aged 84 years, after 45 years' connection with the Company. He was appointed Secretary on Jan. 1, 1880, which position he held until he retired in April, 1911, when he was unanimously elected a Director. An exceptionally able and cultured gentleman, he gave of his best to the Company, to which he was intensely attached; and we owe him our grateful thanks for much loyal and valuable service. We miss him as a friend and colleague, and look back with grateful appreciation to the many advantages which his connection with the Company conferred upon it.

ADMINISTRATIVE CHANGES.

You will have observed in the report the statement that we have elected Mr. Stanley Jones to the seat on the Board vacant by the death of his father, and the reason for his resignation as Chief Engineer and General Manager. I desire to place on record our sense of appreciation of the excellent work which he did for the Company during the 25 years in which he served it as Chief Engineer and General Manager, and the great value which we attach to the continuance of his service in the capacity of a Director. ["Hear, hear."] His knowledge and experience will always be an asset of great importance to the well being of the concern. To fill the other vacancy, we have elected Mr. A. M. Paddon, whose qualifications as a gas engineer and administrator are too well known, and too highly appreciated, to need any commendation from me. ["Hear, hear."] I will only say that, in the opinion of us all, the shareholders are much to be congratulated that Mr. Paddon was able and willing to accept our invitation to him to join the Board. We have already derived great advantage from his presence with us; and I am assured that his wise counsel and intimate acquaintance with gas affairs will continue to be of great and tangible value. We had the utmost confidence in appointing Mr. F. J. Bradfield to the position of General Manager and Secretary; and he has already proved his worth, as on many previous occasions in a less exalted sphere. Mr. A. E. Williams, who was selected for the post of Chief Engineer, has had a long association with Mr. Stanley Jones in the engineering department; and I am assured that he will make a great success of his new post. He also deserves and possesses our entire confidence. This completes the changes in the *personnel* of the management which have taken place during the year; and I will now turn to the results of the twelve months' work.

GAS PRICE AND CONSUMPTION.

When I addressed you at the meeting held a year ago, I had to express regret that the accounts—those of the year 1924—which I had the honour of submitting to you were not so satisfactory from the point of view of the balance available for dividend as it has been usually my pleasure to present; and I foreshadowed a possible increase in the price of gas. This anticipation proved to be correct. In consequence of the rapid fall in the value of residuals, and in a smaller degree to the national increase in the rate of wages, the price of gas was raised from 8·8d. per therm to 9·4d. per therm at the beginning of April. Incidentally, I would mention that our big neighbours, the Gas Light and Coke Company, were for the same reasons compelled to raise their price from 8·6d. to the same price, 9·4d. per therm as from July last. The accounts for the year show that the action of the Board was not only justified, but necessary. As a consequence, we are able to announce a small surplus on the year's working, over and above the statutory dividends and interest, and amounting to £5689, in the place of the heavy deficit of the previous year. This result your Directors consider satisfactory; but it would not have been possible without the increase in the price of gas. There are, however, several factors contributing to the result. The increase in the gas sales was 2·12 p.ct., which, having regard to the abnormally mild weather that prevailed during all the months of the year, with the exception of January and December, is gratifying, following, as it does, an increase of 6·4 p.ct. during the previous year. The sales of gas exceeded those of 1924 by nearly 84 million c.ft.; and the total sales reached the record figure of 4,039,606,000 c.ft., equal to 19,188,128 therms. Analysis of these sales reveals the fact that trade consumption (subject to discount) was 9·42 p.ct. higher; general consumption (subject to discount) was 4·02 p.ct. higher; ordinary domestic consumption was 0·88 p.ct. higher; and prepayment meter consumption was 3·85 p.ct. higher. On Dec. 4 we sent out 18,798,000 c.ft., which constitutes another record for one day's output of gas.

LARGE DEMAND FOR GAS APPLIANCES.

I drew your attention last year to the large demand for gas stoves. This has continued during the whole of the year under review. You may have noticed that the Company now has 112,254 stoves at rental, equal to 96 p.ct. of the number of consumers. This, however, does not represent the number actually in use on the district. In 1924 we sold, either for cash or by hire purchase, 1291 heating and cooking stoves; last year we sold 1679. In addition, there are probably some that have been purchased from other sources. The value of these stoves, both to the users and to the Company, was evidenced in the cold snap we experienced in the early part of December. The modern gas fire is a scientific heating apparatus; and once it is installed—whether in a living room, bedroom, or office—it is rarely dispensed with. The total sales of appliances—*i.e.*, fittings as well as stoves—amounted to £15,379 during the year, and is the largest amount received under this heading in the history of the Company. To give you an instance of the demand for a reliable fitting, I would mention that we supply a very efficient inverted burner, with mantle and half-opal globe, at 2s. 6d. each, complete in a box; and no less than 8651 of these have been sold during the year. This number we expect to exceed during the current year. The amount realized for gas was £716,892, or £45,658 above the amount for the previous year, by far the largest part of which is due to the higher price charged.

COST OF COAL.

Another factor was the cost of coals. At the beginning of last year, we had made purchases of coal, at substantially lower prices, sufficient for our requirements to March or April of the current year. Subsequently, however, owing to the marked falling-off in the export trade, prices of coals fell. We decided, therefore, to purchase supplies for a further twelve months, and by marrying the prices over the two years secured a further reduction in the cost per ton over a large part of the past year. I am satisfied that we acted wisely. I have mentioned many times before that the Company is handicapped by being unable to unload large steamers at any of its works. We have been compelled, therefore, to use comparatively small vessels of from 600 to 1000 tons burthen, which are much more expensive to run than larger vessels of (say) twice their size; and the result has been that the two larger Metropolitan Companies have of late years usually shown from 2s. to 3s. per ton saving on the cost of coal compared with us. Last year, however, we secured our coal requirements at less than one-fifth of a penny only above the cost to the Gas Light and Coke Company. It will interest you to know that for the current year and with an option to continue the contract in future years, we have made an arrangement with a firm of steamship owners to carry the coal to our largest works situated at Poplar, on Bow Creek, up the River Lea (which are accessible only to barges or to small and costly steamers), at exceptionally low rates. This arrangement will result in a considerable saving on the freightage of coal to that works.

STANDARD PRICE REVISION.

Before dealing in more detail with the accounts, I must briefly refer to the revision of the standard prices of the various gas companies. I explained last year that the Company has always been prejudiced by being considered one of the three Metropolitan Companies, and being compared with the other two, which are respectively four times and ten times our size. The revision of our standard price followed immediately after that of the Gas Light and Coke Company, and was no doubt influenced by the decision in their case. That Company is now making a further application for revision. It has also a Bill in the next session of Parliament for various purposes, and among them the fixing of a minimum dividend. There are also other applications being made to the Board of Trade on lines beyond the restricted limits of section 1 of the Gas Regulation Act. It is a matter of great regret to my colleagues and myself that at the present price of gas we are not able to pay a dividend at least equal to the pre-war dividends. We have not thought it advisable to take any steps for a further revision at the present time; but I wish to assure you that your interests are not being neglected. We are keeping a close watch on the position, and will take immediate action, as soon as it appears to us that the opportune moment has arrived to do so.

GOVERNMENT ELECTRICITY PROPOSALS.

Another matter to which I think you will expect me to refer is the effect on the gas industry of the Government proposals in regard to electricity. There is no doubt whatever that our competitor electricity is having, by reason of the publicity given to the scheme in the Press,

a most excellent advertisement, and for the same reason electrical manufacturing companies' shares and electric lighting companies' stocks are enjoying a miniature boom. Gas stocks, on the other hand, are depressed by the same cause; and it is possible that some of our stockholders are anxious as to the future position. I should like to say at once that your Directors do not regard the future with anxiety. The Company has to compete with the lowest price for electricity in London, and the gradual expansion of our business shows quite clearly that we are competing successfully. The industry, however, is fully justified in protesting against State aid being given to electrical undertakings. These undertakings are quite capable of looking after themselves, as is evidenced by their prosperity and the high rate of dividends which they pay—as to which I would mention there have been no restrictions, as in the gas companies' case, until this year. The Ministry of Transport very courteously invited representatives of gas companies to a conference on the subject, and gave a brief explanation of the scheme. The industry, through the National Gas Council, have replied (or are replying), stating their views, and reserving the right to make representations at a later date. Until the Bill is introduced, details of the scheme cannot be discussed. But it has already been stated by a prominent electrical authority that it is not to apply to London; and although the forty or fifty million pounds which it is proposed to expend may benefit electrical apparatus manufacturers, there is considerable doubt whether the consumer or the country will benefit.

THE COKE POSITION.

Turning to the accounts, it will be seen, in Statement No. 8, that the coals carbonized were 262,000 tons. This quantity is 13,329 tons less than the previous year, and is due to the higher percentage of carburetted water gas made—*i.e.*, 19¼ p.ct., against 13¼ p.ct. in 1924. As this gas, from the point of view of actual manufacturing cost, is usually more expensive than coal gas, I should like to explain the reason for the increased make. I have already referred to the fall in the value of residuals. Stocks of coke accumulated in the earlier months of the year in an alarming manner. At one time the three Metropolitan Companies held over 300,000 tons of coke. The Company's stock in March last was over 16,000 tons, which, to the best of my belief, was a record in the history of the Company. Prices naturally fell rapidly; and as considerable quantities are used in the manufacture of water gas, and the price was low, it became advisable to increase the percentage manufactured. This is one of the advantages of water gas; but there is another important factor. It also enables gas companies to meet any sudden abnormal demand for gas. This was emphasized during the month of December, when we experienced an unexpected cold spell of weather. Before leaving this question, I would say that the coke position improved considerably at the close of the year. Stocks have diminished to normal quantities; and the price, while it is not so good as we should like it, is improving.

THE CAPITAL ACCOUNT.

It will be seen in Statement No. 3 that the sum of £8361 18s. 5d. has been charged to capital. The main items that make up this amount are: Freehold property, £4471. This represents some cottage property which, owing to the proximity to the Poplar Works, it was advisable to acquire. Sundry additional plant, £3210; additional stoves, £9349; prepayment meters and fittings, £1144—making a total of £18,174. The credits are: Mains and service meters, £440; and steamship depreciation and sale of s.s. "Aberdale," £9372—total, £9813, and leaving the net expenditure at £8361. The sale of the steamship was rendered possible by reason of the better running of the Company's vessels. It will be apparent to you that it is better—especially when charter rates are low—to be undershipped than to have excess carrying power. I would also mention that the new arrangements made for the freightage of coal to our Poplar Works will involve the sale of our three smaller vessels—in fact, one has already been sold. We have had in the past good value from these vessels, which were built specially to our requirements some years ago. Incidentally, they have, by depreciation, all been written off the capital account. The total capital expenditure, compared with the volume of business done, is again lower than in the previous year, and is at the rate of £379 per million c.ft. of gas sold.

REVENUE ACCOUNT.

Turning to the revenue account, Statement No. 4, there is an increase in the receipts for gas of £45,658, and a reduction in the cost of coal and oil of £58,494, which together make £104,152. Against this we have to set off the heavy fall in the amount realized for residuals, amounting to £71,990, of which coke realized less by £60,738, breeze by £400, tar by £8688, and liquor by £2164—leaving with other less important variations on both sides of the account, a net increased profit of £37,033. After adding to the profit of the year—viz., £139,810—the balance brought forward from the previous year (£33,747 8s. 8d.), and deducting the interest on the debenture stock and temporary loans amounting to £24,479 15s. 6d. there remains a sum of £149,077 16s. 9d. The dividends paid in August at the rates of £5 6s. 8d. p.ct. per annum on the 4 p.ct. stock and £5 3s. 4d. p.ct. per annum on the 3½ p.ct. stock, absorbed £54,820 16s.; and the payment of dividends which we recommend at the same statutory rates for the past half-year will leave a balance of £39,436 4s. 9d. to be carried forward to the current year, which is £5689 more than the balance brought forward. What the future will be, no one can foretell with any certainty. The Company's prospects are excellent. The demand for more gas continues; and at the present time coals are cheaper. But there are one or two clouds on the horizon. We do not know, for instance, what is going to happen when the subsidy to the coal industry ceases to be paid; and claims are again being advanced for increased wages. But if these clouds pass away, there is every prospect of a successful year. I now beg to move:

> "That the report and accounts be received, adopted, and entered on the minutes."

The DEPUTY-CHAIRMAN (Sir Frederick Green, K.B.E.) formally seconded the motion.

Mr. S. M. WOOD, referring to the amount invested, £153,424, asked what funds it represented.

The CHAIRMAN replied that it represented the Insurance fund, Pension fund, and the Profit-sharing fund.

The report and accounts were then unanimously adopted.

THE DIVIDEND.

Moved by the CHAIRMAN, and seconded by the DEPUTY-CHAIRMAN, the following dividend motion was agreed to; the former remarking that the distribution recommended was the full statutory dividend:

> "That pursuant to the recommendation of the Board of Directors, a dividend be declared for the half-year ended the 31st of December, 1925, after the several rates of £5 6s. 8d. p.ct. per annum on the 4 p.ct. stock and £5 3s. 4d. p.ct. per annum on the 3½ p.ct. stock of the Company, in both cases less income-tax, payable on the 19th of February; and that warrants for the same be forwarded by post to the proprietors."

RE-ELECTIONS AND THANKS.

The DEPUTY-CHAIRMAN, proposing the re-election of the retiring Directors (Mr. W. G. Bradshaw and Lord Marshall, P.C., K.C.V.O.), said he did not know what the Company would do without either of them. It was a great honour to have them as Directors.

Mr. H. W. GELL, O.B.E., in seconding, alluded to the great services rendered by both gentlemen to the Company.

The resolution was carried unanimously; and the retiring Auditor (Mr. G. W. Ilsley) was thereafter re-appointed on the proposition of Mr. O. C. HILLS, seconded by Mr. J. A. FLETCHER.

The CHAIRMAN said the only other duty he had to perform was the pleasant one of moving the usual vote of thanks to the staff and workpeople of the Company. When he said "the usual vote of thanks," it must not be thought that this was a mere matter of form. The staff and workpeople of the Company all deserved their most hearty thanks for the excellent work that they did. The Company had no troubles or difficulties whatever with them; and he believed that all the employees were loyally attached to their service. Certainly, they could not produce from year to year the results which the Board had the honour of laying before the proprietors, without giving the best service. When he came to the chief officers, there was very little to say which he had not already said. They were very much indebted to Mr. Stanley Jones for the excellent work he did for many years; and as he was their Chief Engineer for the first three months of the year with which they were dealing, he was really included in this vote. They were very sorry to lose his services as Chief Engineer, though they were glad to gain the benefit of his experience in the Board room. With regard to Mr. Bradfield, he really was the General Manager of the Company, and he managed everything in the most tactful manner. They were very fortunate in having so excellent an Engineer as Mr. Williams to put in the place of Mr. Jones. Mr. Williams was doing valuable work for the Company. He was very cautious and careful—two attributes which he (the Chairman) appreciated more and more as he grew older. Unfortunately, Mr. Williams was unable, owing to indisposition, to be present at the meeting. He would also like to mention the head of their distribution department, Mr. Tooth, who was the life and soul of the Company's connection with the public. He it was who pushed the sales and made gas popular in the district. But all ranks had served the Company well, and all deserved hearty thanks.

Mr. FRANK JONES seconded the vote, which was cordially passed, and was acknowledged by Mr. BRADFIELD.

Mr. FRANK JONES proposed a vote of thanks to the Chairman and Directors for their services during the past year. After what they had heard, they should feel very thankful that they had such a Board.

Mr. WARTH seconded the motion, and congratulated the Directors upon having secured Mr. Paddon as a colleague.

The CHAIRMAN, acknowledging the vote (which was heartily accorded), agreed that it would have been impossible to find anyone with a greater reputation and a wider experience of the industry than Mr. Paddon. They were all proud of the Company, and believed that it had a successful future before it.

Wandsworth, Wimbledon, and Epsom District Gas Company.—In the report for the year ended Dec. 31 last, which will be submitted at the annual meeting next Tuesday, March 2, the Directors express their profound regret at the death of Mr. H. E. Jones, who was Engineer to the Wandsworth Company from 1864 to 1869, became a Director in 1874, and was Chairman from 1904 to the time of his death. The accounts show an increase in the sale of gas of 2·8 p.ct. The number of consumers has increased by 1859, and of stoves and other appliances by 5075. The Gas Referees have certified that the gas supplied averaged during the year 474·9 B.Th.U., as against the declared standard value of 470 B.Th.U. It was found necessary to increase the price of gas from the Lady-day quarter of 1925 by three-fifths of a penny per therm. The profit and loss (net revenue) account for the year, after providing for the interest on debenture stock and on deposits and loans for the past twelve months, and the dividends for the six months ended June 30, 1925, at the statutory rates, shows a balance of £50,331. The Directors therefore recommend payment of dividends for the half-year to Dec. 31 last as follows: On the 5 p.ct. preference stock, 5 p.ct., and the statutory rates on the Wandsworth "A" stock £8 10s., the Wandsworth "B" stock £7, the Wandsworth "C" stock £5 19s., the Wimbledon stock £6 12s. 6d., the Epsom stock £7 2s. 6d., and the new ordinary stock £5 19s., all at p.ct. per annum. The meeting will be held at the Cannon Street Hotel, at 3 o'clock.

TOTTENHAM DISTRICT LIGHT, HEAT, AND POWER COMPANY.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Company was held on Tuesday, Feb. 16, at the Offices, No. 639, High Road, Tottenham—Mr. HENRY WOODALL in the chair.

The SECRETARY (Mr. E. J. K. Fussell) read the notice convening the meeting; and the Directors' report and the statement of accounts for the year ended Dec. 31 were taken as read.

THE LATE MR. H. D. ELLIS.

The CHAIRMAN, on rising to address the proprietors said: My first and sad duty is to refer to the loss we have had since our last annual meeting by the death of our esteemed colleague Mr. Hubert Dynes Ellis, who was on the Board for nine years. We miss him very much indeed. We have elected Mr. Thomas Goulden to fill the vacancy.

THOROUGHLY GOOD AND SATISFACTORY ACCOUNTS.

It is with pleasure that I put our accounts for last year before you. They are thoroughly good and satisfactory; but this will not compensate you for the fact that your dividend is reduced and your stock has decreased in value to a serious extent. This is due principally to two causes. First, the revision of the standard price which resulted in a large reduction—namely, from 17·6d. per therm to 13·8d. per therm. Secondly, the Government's proposals with regard to electricity. We have been somewhat hardly treated. This Company has always served the public well. Before the war we supplied gas at a lower price than any of the other London Companies, except the Wandsworth Company. Since the war wages have been equalized in the London district, about which we make no complaint; and we had, as you know, to spend very large sums indeed in extending our works to meet war demands, at a time when building was most costly. The result has been that we, who have no water carriage for our coal, can no longer sell gas as cheaply in comparison as we did. We are what is known as a sliding-scale Company; and gas companies working under a sliding-scale have suffered very severely compared with those which have a maximum price of gas and maximum dividend. This is particularly hard, as, under the sliding-scale, everybody benefits in a well-conducted undertaking. I need not explain to you in detail the sliding-scale, but will only say that under it if the price is raised the dividend must be lowered, and if it is reduced the dividend may be raised; and so, if by reason of efficiency of men and management the price is lowered, everyone benefits—the consumer, the shareholder, and the worker, but most of all the consumer. He receives, in our case, seven times as much as the shareholder. Had this been thoroughly understood, I think the authorities would have treated us more liberally. While we are working under an ideal system, which could only have been rendered unfair by a great upheaval, many other companies, who had a maximum price and dividend, had no difficulty in paying full statutory dividends during the war period and to date.

PRICE REVISION AND DIVIDEND.

When our price was revised at the instigation of the Middlesex County Council in April last, our officials put forward very excellently prepared figures. Some of these were estimates; but even our estimates turned out to be unfavourable to ourselves. These were not accepted; but the even less favourable figures of the advisers of the Board of Trade were adopted, with the result that the dividend allowed us was only 6¼ p.ct. as against the 6½ p.ct. we were then paying and £8 12s. 6d. p.ct. we were entitled to pay. This proves my point when I said must reduce, but may increase, dividend. We did not distribute the full dividend to which we were entitled, but only paid a dividend we felt we could justify and maintain. Later we had to raise our price, and the statutory dividend to-day is only £5 17s. 6d. p.ct.—a lower dividend than we paid in 1914. The result has naturally been a very considerable fall in the value of our stock, and this does seem to be a factor the Board of Trade might consider; but I gather it is outside their purview. The consequence will be that gas companies will no longer care to take advantage of the Gas Regulation Act, 1920, but will still prefer the more expensive procedure of going to Parliament direct, where they appear before a tribunal who take all matters into consideration. Had our estimates been accepted by the Board of Trade, we should have been given a standard price of (say) 14·4d. per therm, and in consequence could have paid a dividend of £6 5s. p.ct., or 7s. 6d. p.ct. more than we have been able to do. The cost of this extra dividend would have been only £3759. Now consider the question of capital. In 1914 our ordinary "B" stock—the bulk of our stock—stood at 117 p.ct.; to-day the price is, ex div. (say) 87 p.ct., and before the revision it was quoted at 104 p.ct. It may well be that the future cost of capital, unless we can regain the confidence of the public, will be a greater charge for all time on the undertaking than a slightly increased dividend. We must have some security for a reasonable return on our capital, and also be freed from the handicap we are now under that at any time we can be brought before the Board of Trade for revision. Parliament alone can do this; and we shall probably promote a Bill next session for the above and other purposes. This does not mean that we may not get some relief from the Board of Trade before then.

GOVERNMENT ELECTRICITY PROPOSALS.

With regard to the Government electricity proposals, I will say little, but will refer you to the report in "The Times" of the 6th inst. of the speech of the Governor of the Gas Light and Coke Company, and also the allusion to it in the "City Notes" in the same publication. The comments are fair and reasonable, as one expects from our leading newspaper. We want no favour—only fair and equal treatment. While I personally view with alarm any incursion of any Government into industry, which is much better left in private hands, I recognize that public service companies must be controlled; and the gas legislation has been, on the whole, a model of what such control should be. One point cannot be too often stated when considering the Government proposals—namely, that coal is our greatest asset, but a diminishing asset, and should be carefully conserved; and in consequence we do well to remember that of the coal used in gas-works 80 p.ct. of the heat content is recovered, whereas when used to generate electricity only 20 p.ct. of the heat content is recovered. The Electricity Bill embodying the proposals of the Government is not yet available; but there are many well-known authorities on electrical matters who, so far as it is known, are not satisfied as to its advantages. Any powers desired or needed for cheaper and better production and distribution of electricity could be obtained in the ordinary way by application to Parliament. There is no fairer tribunal than a House of Lords or House of Commons Committee; and I am confident that the decision of such a Committee, after hearing any case argued before them, is much more likely to be right and in the best interests of the public than any Government measure. The Government proposals are boosting the electrical industry (which can be trusted to boost itself), with the result that the industry and allied trades are getting a valuable advertisement. At an important gathering of electricians recently, a member of the Government described the electrical industry as one of the brightest spots in a picture that would otherwise be dark. It is true, and we are glad of it, that the electrical industry is prospering; but from a national point of view it would be more true to say the gas industry is the brighter spot in the picture. The electrical industry is paying large dividends and using coal extravagantly. We—the gas industry—on the other hand, are paying small dividends, using coal to much greater advantage than our competitor, and have many schemes for the welfare of our workers that have, I believe, no counterpart in the electrical industry. Only one other point—namely, with regard to price and discounts. You are probably aware that in the Model Gas Bill discounts are limited to 25 p.ct., whereas you will find that electricity is charged-for for one purpose at as much as ten times the rate for another in the same dwelling. I am inclined to think that the general public would be better served if the price of lighting were considerably reduced, even if the price for heat and power were raised. Large users of power can almost always manufacture electricity for themselves at a lower price than it can be distributed to them.

THE ACCOUNTS.

We will now turn to the accounts. You will see that we had to issue further capital to meet our growing business. In April last we issued £150,000 of 5½ p.ct. preference stock, on which we received £3513 18s. 6d. as premium—a very successful issue. We expended on capital a net sum of £89,960. Of this, £7781 was spent on land adjoining our Willoughby Lane Works, which has been, and will be, very useful to us. The largest item under the head of capital is £80,860 on mains and services. We have laid a 48-in. diameter main to the centre of our district. This was essential to meet the demands upon us, and to enable us to maintain the standard pressure now imposed and to avoid relying on pressure raising by mechanical means, which we have had to do at a somewhat high cost, and to a greater extent than we consider prudent working. The cost of meters and stoves, £24,374, is high; but ample expenditure on meters is sound policy, and the result is reflected in the reduction of unaccounted-for gas. We now turn to the gas revenue account. On the debit side of the account there are only two items calling for special attention. We have been able to place £10,000 to the renewal fund. This, you will agree, is a wise provision, as we shall almost certainly have some expensive renewals to meet this year. We regret that the co-partnership bonus is down £500, on account of the reduction of dividend. On the credit side of the account the figures are good, except with regard to residuals. The receipts under this head are down by £39,000; and it is for this reason we had, in March last, to increase the price of gas.

THE ELECTRICITY UNDERTAKING.

Before saying anything about the electricity accounts, it is my painful duty to tell you of the death, only a few days ago, of our Electrical Engineer, Mr. J. Fisher. Much of the success of the undertaking was due to Mr. Fisher's great ability and hard work. He earned the respect of all those with whom he was brought in contact; and many of us feel we have lost, not only a splendid servant, but also a good and trusted friend. The electricity revenue account shows an increase of £2000. The increase in the sale of electricity is 22·16 p.ct., which does not seem to show that the supplier of electricity needs outside help. Our experience in Wood Green, where we supply both gas and electricity, is illuminating, as showing that the introduction and rapid growth of electricity does not necessarily mean a reduction in the use of gas. In fact, as we know, electricity has not restricted the normal growth of gas undertakings. In Wood Green, while we have had a very rapid increase in the sale of electric current, we have in this particular area had a larger increase in the sale of gas than in the remainder of our district. This will, I hope, strengthen the view of gas shareholders generally that our product will hold its own, and that the undoubted convenience of electricity for some purposes only helps us, as it adds to the amenities of the district we supply.

REDUCTION IN PRICE OF GAS.

Our accounts show that we are in a position to reduce the price of gas; and this we have done. From Jan. 1 the price to ordinary consumers will be reduced by two-fifths of a penny per therm. We are not reducing the price to prepayment consumers on this occasion, as it is not possible at the present moment to give them an extra cubic foot of gas for a penny (the smallest reduction possible), for that would give them double the advantage we are giving the ordinary consumer; and, further, the provision of prepayment installations is becoming increasingly expensive. The cost to the Company of the reduction in price will be about £12,000 in the year; and the increased dividend to the shareholders, if paid, will cost £2500. I will not take the accounts in detail now, but shall be pleased to answer

any questions you may wish to ask upon them. The net result is that, after placing £10,000 to the renewal fund and making ample provision for the upkeep of works and district, we are able to pay the full statutory dividends and increase the carry forward, which now stands at £39,538, by just over £5000.

STATE PENSIONS ACT.

The State Pensions Act will cost the Company an additional £1000 a year, and is a matter which has received the attention of your Directors. They have carefully examined the position, in order to ascertain what undue burdens (if any) are thrown upon the co-partners—that is, the workman, the consumer, and the shareholder. The Directors will put the whole position before the co-partners and Works Committee, and take the views of the men. They will point out that the position is altered by the new Act, and that it may be necessary to reconsider the benefits and to provide against any further burden being put upon the Company by possible increases in Government pensions. You quite understand that we shall in no case depart from our agreements with existing employees, except with their consent and approval.

INTERESTING FIGURES.

During the year the sale of gas increased by 4·06 p.ct. There has been a large increase in the number of appliances fixed; and there has been a satisfactory increase in the consumers, who now number over 90,000. We have also provided 227 more public lamps. Unaccounted-for gas has been reduced by 3·14 p.ct. in the last two years, and now stands at the reasonable figure of 4·8 p.ct. These are all satisfactory figures. Other gratifying things are the growth and development of our co-partnership and pension schemes. The partners, 1121 in number, have invested in the Company £35,500. The pension fund now stands at £101,251. These figures show that our men are substantially interested in the Company; and we feel that now they have seen co-partnership and pensions actually functioning, they agree that we, the Directors, supported by you, ladies and gentlemen, are not unmindful of their interests. When you have such figures as I have been able to put before you, I think you will be satisfied that you are connected with a thoroughly sound undertaking; and I cannot help feeling that, when Parliament hears our story, they will say that the shareholders of this Company are entitled to a more reasonable dividend and a more reliable tenure of the same. The results I have given you could not have been attained without the full co-operation of all concerned. We, as a Board, have every reason to be gratified with, and grateful for, the service we have received from our chief officials, their staffs, and the workmen. No company are better served than we; and there can be few in which there is so much mutual confidence and trust between employers and employed. I now beg to move:

> "That the report of the Directors and statement of accounts for the year to Dec. 31, 1925, be received and adopted, and that the report be entered on the minutes of the proceedings of this day."

Mr. G. HAY MORGAN, K.C., formally seconded the motion.

Mr. A. W. REID said he noticed in the gas revenue account that the item "Salaries of Engineer, assistant, and clerks" had gone up from £7491 a year ago to £9962. This was an increase of about 30 p.ct.

The CHAIRMAN explained that many of the officials had houses, gas, and coal free; but the Directors thought it was much better that these houses, which were the property of the Company, should be let to them at a reasonable rent, and that they should pay for gas and coal. This course was adopted; and naturally the salaries of the officers affected were raised to provide for these additional expenses. This accounted for the addition to the item of salaries shown in the accounts; but in reality there was no increased outlay, because the Company got all the extra money back.

THE DIVIDENDS

The DEPUTY CHAIRMAN (Mr. Henry Bailey) next moved:

> "That the dividends paid on Aug. 11, 1925, in respect of the half-year ended June 30, at the rate of 5½ p.ct. and 5 p.ct. per annum on the preference stocks, 7⅞ p.ct. per annum on the "A" stock, and 5⅞ p.ct. per annum on the "B" stock, all less income-tax, be and are hereby confirmed.
>
> "That a dividend at the rate of 5½ and 5 p.ct. per annum on the preference stocks, 7⅞ p.ct. per annum on the "A" stock, and 5⅞ p.ct. per annum on the "B" stock, all less income-tax, be declared for the half-year ended Dec. 31, 1925, payable on and after Feb. 23, and that the dividend warrants be sent to the proprietors by post."

Mr. A. E. BROADBERRY seconded the motion, which was agreed to.

RE-ELECTIONS AND THANKS.

The CHAIRMAN said his next pleasant duty was to propose the re-election as a Director of Mr. George Hay Morgan. He had been on the Board for some seven years, and every year they found him a more useful colleague.

Mr. W. A. SURRIDGE seconded the proposition, which was carried.

Mr. HAY MORGAN, returning thanks, remarked that serving the Company was very happy work. He thought that the splendid position in which the affairs of the Company that day were was a tribute to the united work of the Directors.

The CHAIRMAN next proposed the re-election as a Director of Mr. Thomas Goulden, who, he said, had been for only a very short time a member of the Board; but the Directors realized at every meeting how wise they had been in asking him to join them, and how fortunate it was for them that he had accepted the position. No doubt, most of those present knew Mr. Goulden, whose name was a household word in the gas industry. He was for many years Chief Engineer of the Gas Light and Coke Company, and on his retirement from that position became a member of the Court of Directors of the Company. He was a gentleman of great ability, and enjoyed the respect of everybody who knew him.

The DEPUTY-CHAIRMAN seconded the motion, which was agreed to.

Mr. GOULDEN thanked the Chairman for his kind remarks, which he said were all too flattering.

The retiring Auditor (Mr. William Cash) was re-appointed, on the proposition of Mr. F. W. CHURCH, F.C.I.S., seconded by Mr. J. TAYLOR.

Mr. W. G. BROWN proposed a vote of thanks to the Chairman, Directors, Auditors, officers, staffs, and workmen for their services to the Company during the past year. From the statement which the Chairman had made, it was, he said, easy to realize the difficulties that had had to be contended with; and they could not but appreciate the expeditious and thorough manner in which these difficulties had been dealt with. As to the workpeople, those who went about the district could not help seeing the interest they took in their employment; and it was largely owing to the excellent manner in which they carried out their duties that the business of the Company went on so satisfactorily.

Dr. SCOTT, with a few appreciative remarks, seconded the vote, which was heartily passed by the meeting.

The CHAIRMAN said this kind acknowledgment of their services on the part of the proprietors was appreciated by all connected with the Company. Such an expression of approval was particularly gratifying in view of the fact that, though the Company were doing well, the dividend was lower. The Board had done their best, and sincerely hoped the shareholders would have a better return on their money—which the Directors felt they ought to have. The reduction in the price of gas to which he had referred would, of course, do some little towards this.

Mr. FUSSELL, acknowledging the vote on behalf of himself and his staff, said he had unbounded faith in the continued growth of the gas industry as a whole, and of their Company in particular. In justification of this confidence, he need mention only one figure. During the last three years the Company's sales of gas had increased by no less than 20 p.ct., which meant that, if the same rate of expansion continued, in fifteen years they would double their consumption.

Mr. HAROLD C. SMITH (the Chief Engineer), on behalf of himself and the technical staff and workmen, also thanked the shareholders for their vote. He said the Chairman had already referred to the co-operation which existed between all who were connected with the Company; and he (Mr. Smith) could thoroughly endorse this. They were a very happy team, right through the service. The Company had an excellent lot of workmen; and the position the undertaking occupied to-day was largely due to the spirit of goodwill that had so long prevailed.

GRAYS AND TILBURY GAS COMPANY.

The Ordinary Yearly General Meeting of the proprietors of the Grays and Tilbury Gas Company was held at Kennan's House, Crown Court, Cheapside, E.C., on Thursday, Feb. 18, when final dividends were declared at the rate of 6 p.ct. per annum on the preference shares for one month; at the rate of 9½ p.ct. per annum on the "A" shares; and at the rate of £6 13s. p.ct. per annum on the "B" shares—less income-tax—for the year ended Dec. 31 last.

The CHAIRMAN (Lt.-Col. F. E. Bartlett), in proposing the adoption of the report and balance-sheet, reviewed the accounts, which showed that the balance carried to profit and loss account, after providing for depreciation of gasholders, meters, and stoves, and for old works, and placing £1625 to the credit of the renewal fund, was £18,045, which, with the balance brought forward from the last financial year (£4491), made a total of £22,536. After providing for interest on debentures and other charges, and the payment on Sept. 1, 1925, of interim dividends of 8½ p.ct. per annum on the "A" shares and £5 19s. p.ct. per annum on the "B" shares (both less income-tax), amounting to £3855, there remained a balance of £11,089 available for distribution. The dividends declared, together with the interim dividends paid in September, made an average distribution for the year of 9 p.ct. per annum on the "A" shares and £6 6s. p.ct. per annum on the "B" shares (less income-tax), leaving a balance of £6700 to be carried forward, as against £4491 for the previous year. The Chairman congratulated the shareholders upon the results of the year's working, which, he was sure they would agree, were satisfactory. The number of consumers upon the Company's books had increased during the year under review by 901, making a total of 11,604; while the number of cooking stoves on hire had increased to 7203. The sales of gas showed an increase of 129,201 therms, or 12·84 p.ct., as compared with 1924. The continued and remarkable increase in the sales of gas throughout the large area supplied showed that good progress was being made.

Mr. COURTENAY C. S. FOOKS (Deputy-Chairman) seconded the motion, which was carried unanimously.

Lt.-Col. F. E. Bartlett and Mr. Courtenay C. S. Fooks were unanimously re-elected Directors of the Company; and the Auditors (Messrs. Howard, Howes, & Co.) were also re-appointed.

A vote of thanks was accorded to the Directors for their management of the Company's affairs. The Chairman suitably responded on behalf of the Board, following which a vote of thanks was proposed and carried to the Engineer and Manager (Mr. A. W. Sumner), to the Secretary (Mr. Wm. F. Whittaker), and the staff and workmen.

GAS REGULATION ACT APPLICATION.

There has appeared in the "London Gazette" the following notice regarding an application to the Board of Trade under the Act.

DECLARATION OF CALORIFIC POWER.

Oswaldtwistle Urban District Council.—480 B.Th.U. (March 8.)

Birmingham rates have been approved at 16s. in the pound—the same amount as last year. Contributions to the relief of the rates were made by the following Corporation Departments: Electricity, £31,000; Gas, £41,000; Tramways, £28,000.

HORNSEY GAS COMPANY.

The Cheapest Gas in London.

The Annual Ordinary General Meeting of the Company was held last Friday, at No. 5, Great Winchester Street, E.C.—Mr. A. M. PADDON (the Chairman) presiding.

The SECRETARY (Mr. K. Leslie Mortimore) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said he did not think there was anything in the report itself that could not be more appropriately considered in connection with the accounts. All the points were involved therein; and he did not believe they could even consider the accounts—quite apart from any just estimation or criticism of them—without bearing certain facts in mind. In noting these figures, it must be realized that they were attached to an undertaking of very moderate size, which did not put out 1000 million c.ft of gas a year. As a matter of fact, the actual sales amounted to 760 million c.ft. per annum; and this constituted a relatively limited scale of operations compared with their neighbours. And it must always be remembered that the Company were selling gas at the lowest price in the whole of the Metropolitan area. There was another Company who sold gas at a slightly lower rate in a portion of their district; but, taken in the entirety of its operations, the Hornsey undertaking was selling gas at the lowest price in London and its environs. This meant that there must be considerable limitation in expenditure and a very close measure of economy, if their proud position in this respect was to be maintained in the future, as it had been in recent years, and if they were to continue to give to the proprietors the dividends and the results which they had been able to afford them in the past.

LOW CAPITAL PER MILLION.

On turning to the capital account, it would be seen that there was very little difference between the total receipts of the Company in respect of capital and the expenditure of those receipts—no more than £361. Applying the capital expenditure to the business done by the Company, brought out a very low rate of capital per million c.ft. of gas sold; and this was qualified by the fact that £25,000 of this capital did not bear any dividend at all—in other words, it made no demand upon the public for any profit by which to provide dividend or interest. This showed that the liability of the Company in the way of capital was even smaller than the primâ facie figure presented, which amounted to only £363 per million c.ft. of gas sold. In former times it was necessary to exercise care in disclosing such abnormally, but satisfactorily, low figures of capital. They might then have offered an inducement to the Local Authority to expropriate the Company; but he did not think they need be in fear of any such thing in these days. With the general trend of municipal enterprise, and the attitude of the Government (to which he would refer later), it did not seem to him that gas undertakings would be found to offer any very attractive inducement to public bodies to acquire them. Hornsey had an exceedingly active and very well-conducted electrical enterprise of its own; so that the Gas Company might reckon upon preserving their position for some time undisturbed. In considering the capital account, it must be noted that they were owing their bankers £11,000, which strictly speaking should be added to the capital indebtedness of the undertaking; but this was very properly treated as a temporary matter, for they had every prospect of liquidating this loan and restoring the figure to the one shown in the capital account. The revenue account called for little comment; the facts were self-evident. There had been an increase of 1·2 p.ct., which amounted to 9½ million c.ft., in the sale of gas; and there had been expended on capital account £3657, which rather improved the ratio to which he had just referred of capital to business done. The Directors had been compelled to raise the price of gas during the period under review; but even after it had been raised it only came to 8½d. per therm, which still agreed with the statement he had already made with regard to relative prices. The gas sold, partly by increase in volume, and partly by the additional price, had brought them just over £8000 more into this account; but the fall in residual products, to which the increase in the price of gas had been mainly attributable, had robbed them of over £12,000. So that when they came to the bottom of the account, they found that they were £4300 worse off in the matter of receipts than was the case a year ago. But coming to the other side of the account, they had effected economies, as compared with the previous year, amounting to £3733; and taking £573 off the profit as it was twelve months ago, still left them with the very ample sum of £18,249 for their immediate purposes. With regard to the debit side of the revenue account, there was not much to which he need call attention. The carbonizing wages, to those who were closely interested in this matter, formed an attractive feature, because they were less than 2½d. per 1000 c.ft. It was only necessary to refer to the accounts of far larger undertakings than this one to find how extremely favourable this figure was in the way of comparison. It afforded, as a matter of fact, to a certain extent, the key to why they were able to present so satisfactory a statement of account, because it indicated the very high state of efficiency to which the works had been raised under the able management of Mr. Buckley. The item of repairs and maintenance of works and plant was low; and this might make the proprietors apprehensive, if the Board were not able to assure them that the works and plant of the Hornsey Gas Company represented a very high standard indeed in regard to such property. If the proprietors were still further interested in the matter, he would advise them to go down to Hornsey and look at the works for themselves. They were certainly in a most excellent state. The Engineer of one of the three largest gas undertakings in the Metropolis had written him (the Chairman) recently, saying that he had been to see Mr. Buckley, and, speaking with a very wide experience indeed, he had never seen works of higher efficiency, of greater neatness, or in better order. Of course, it was necessary to appreciate the fact that the works were in efficient order, when considering such a very low charge in respect of maintenance. They had spent quite a considerable sum of money on their mains and services—nearly 4d. per 1000 c.ft.; but this simply meant that the Directors had not burdened the undertaking permanently with charges which they found themselves competent to meet during the period under review.

FOR THE EMPLOYEES.

Lower down on the debit side of the revenue account would be seen four items which represented what the Company were doing for their employees; and although the items were substantial, he could assure the proprietors that the money was more than well spent. Anyone who wished to ascertain how wise a policy this was, need only look at the industrial situation all the way round. People were beginning to cast envious eyes on the gas industry, who had succeeded by means of co-partnership and the like in establishing peace and reciprocity with their employees. The proprietors would not grudge these disbursements. The item of gratuities and pensions exhibited an increase of about £200; and this was mainly in consequence of the retirement of their old friend Mr. Roberts, the former Secretary. He remembered Mr. Roberts's appointment with the Company 26 years ago; and he had been more or less in touch with him all through his period of service. A more loyal and devoted officer it would be impossible for the Company to have. Mr. Roberts did what they wanted all co-partners to do—he immersed himself in the business and interests of the Company, and then, in that occupation, found his employment and enjoyment. This, of course, was rather an ideal state of things. But the Directors were doing all they could to enlist the interest of their employees in the undertaking, because they thought they would be happier in this way than in occupying their spare time with criticizing the conditions of their employment and things of that kind. In their endeavours in this regard, the Board felt that they had been successful. Mr. Roberts was rather an extreme instance of a man who had so closely interested himself in the affairs of the Company that he seemed to have had little time to devote to anything outside. The Directors had dealt with him as the proprietors would certainly have wished them to do—as generously as they could—and he only wished that Mr. Roberts's health had been better adapted to the enjoyment of his retirement. Unfortunately, however, he was not well; and no doubt those present would join in sending him their good wishes on this occasion. ["Hear, hear."]

PROFIT AND LOSS ACCOUNT.

The net result was that, paying the same dividends as before—which he thought the proprietors would admit were good ones—they had increased their carry forward by £50, and had managed to carry £1000 to reserve. He thought this was a fairly good result, and hoped the proprietors would be satisfied with it. With regard to the benefit fund, they had also done a little there—while they had taken out £487, they had put into it £787—and profits had been responsible for this augmentation. In the balance-sheet there was little to refer to; but he might draw their attention to the final item on the debit side, which showed that £1500 had been placed to reserve for cost of alterations to works. Their works, as a matter of fact, needed as little alteration as any he knew of; but it was a very proper apportionment to make.

GOVERNMENT ELECTRICITY PROPOSALS—NO NEED FOR ALARM.

He felt that, before putting the motion to the meeting, he must refer to the Government electricity proposals. These had been forced upon the community; and it was impossible to ignore the fact that they had caused a certain measure of disquietude among those gas investors who were not in very close touch with the present position and future prospects of the industry. The proposals had, for example, frightened a lot of poor old ladies who had some money invested in gas concerns, and were dependent upon the proceeds from it for their daily bread. These people were wondering whether their holding in gas companies was as secure as had been the case in the past. This was a serious thing for the investors concerned; and he wished to do all he could to reassure them, and to make them understand that, in his view, they had nothing whatever to fear. When one came to try to analyze the Government proposals, and see exactly what they meant, it was very difficult to do so. It was hard to fix upon anything tangible; but one of the Ministers, Sir Austen Chamberlain, did appear recently to have committed himself to three statements. As he read them, these statements were to the effect that there would be a centralization of the generation of electricity, a pooling of resources, and a standardization of apparatus. These three aims were not very inspiring, when they came to consider them in the light of past history. Take centralization of production. He could remember when it was urged in London that if the source of production of gas could be centralized and taken away from London down to the Essex Marshes, many benefits would accrue. It was said that production would be cheaper; and the incubus and disability of gas manufacture in London would be got rid of. This was fifty years ago; and neither of these things had happened. As a matter of fact, as they knew, the cheapest gas in London was now being made and sold by a company in North London. The undertaking which manufactured it had not been centralized or taken out of town, and had not any of the facilities indicated in connection with centralization; but it was under-selling all those who possessed these advantages. They would remember that when the water supply of London was centralized by being taken out of the hands of the different companies and put under one authority, an increase in the price of water was the first fruits; and these fruits had never dropped off the bough since. More recently there had been another centralization, and that was in connection with the railways. An opinion as to the results of this might be gathered by consulting travellers on the Southern Railway. Next there was going to be

pooling of resources. This was both vague and ominous, and sounded like Socialism; and he did not think they could expect much from it. Finally there was standardization of apparatus. Well, if this was going to be done for industry by the Government, instead of by industry for itself, all he could say was: "God help us!" The Directors were not at all exercised over the Government scheme, in regard to its ultimate effect on the prospects and prosperity of the gas industry, but it would doubtless have certain bad effects. It meant that a large amount of capital would be put out, and that this capital would bring no adequate return. It would in all probability make the issue of capital by gas undertakings temporarily more difficult; but as to its ultimate and final effect upon the relative positions of the gas industry and its competitor electricity, this would only be to worsen the condition of the latter and to make the prospects of the former, which were already promising, brighter still.

The DEPUTY-CHAIRMAN (Mr. G. W. Carey) seconded the adoption of the report and accounts, which was agreed to without discussion.

THE DIVIDENDS.

On the motion of the CHAIRMAN, seconded by Mr. J. M. MILES, it was agreed:

> "That there now be declared dividends for the half-year ended Dec. 31, 1925 (being the final dividends for the year), as follows: On the preference stock, 5 p.ct. per annum, on the 'A' stock, 13 p.ct. per annum, and on the consolidated stock, 10 p.ct. per annum, all less income-tax (making with the interim dividends already paid on the 'A' stock and consolidated stock respectively 13 p.ct. and 10 p.ct. for the year), and that such final dividends be paid on March 1, and that the sum of £1000 be carried to the reserve fund."

The CHAIRMAN pointed out that this was the last occasion on which the dividend resolution would be moved in these terms, because under the Order which became effective at the close of last year the nominal value of the old stocks had been doubled, so as to bring them into a form more easily issued and more easily negotiated by those who held them. It was in the interests of the proprietors.

RE-ELECTIONS AND THANKS.

The DEPUTY-CHAIRMAN proposed the re-election of the retiring Directors, Mr. A. M. Paddon and Mr. J. M. Miles. He said both were so well known to the proprietors that it was almost superfluous for him to point to their qualifications. In Mr. Paddon they had a Chairman of no ordinary ability. His knowledge and his grasp of all the details connected with the administration of a gas company were so great that his services were invaluable to those who were fortunate enough to obtain them. As to Mr. Miles, he brought wide experience and great capacity to bear upon the financial side of the Company's work.

Mr. T. W. SEAGER BERRY seconded the proposition, which was unanimously carried.

The retiring Auditor (Mr. H. A. Floate) was next re-appointed, on the motion of Mr. F. G. PILLEY, seconded by Mr. F. W. CHURCH, F.C.I.S.

The CHAIRMAN proposed a hearty vote of thanks to those who in the main were responsible for the statement which it had been his privilege to present to that meeting—the Engineer and General Manager, the Secretary, the other officers, and the men. Such results would not have been attained unless everybody had worked in the very best possible way. In their Company an extraordinary spirit of co-operation existed between the men and the administration; but they could not have accomplished what they had without the help of a very exceptional Engineer like Mr. Buckley. His results were excellent, and were maintained from year to year. When he looked through the accounts each year, he was amazed at the results Mr. Buckley secured—which were in a large measure due to hard work. The Secretary had not been long with them; but the Directors had already formed a very high opinion of him. He had made both an effective and an attractive impression; and they hoped he would remain with them for very many years. As to the co-partnership, this had worked extremely well, and the prospects were even more favourable than anything they had accomplished up to the present.

Mr. F. H. JONES, in seconding the vote, said there was one particular figure which showed how well they were served. Though they were selling nearly 800 million c.ft. of gas per annum, it took to pay the whole of the half-year's dividend no more than about £7000. He did not know another like it, and only wished all companies were in the same happy position of having to find so small an amount of money when carrying on so relatively big a business.

Mr. J. W. BUCKLEY, M.Inst.C.E. (the Engineer and General Manager), acknowledging the vote, said it was exceedingly gratifying to himself and to those he had the privilege to work with to have such remarks of appreciation made with regard to their services. They had set themselves a very high standard in the matter of cheap gas, and they were determined to maintain it if at all possible. Officials and workmen would co-operate to this end. The co-partners were working well, and were appreciating all the Company were doing for them.

The SECRETARY and Mr. FIELD (a co-partner) also responded; the latter remarking that the majority of the men were well satisfied with the co-partnership scheme, and fully appreciated it, as well as the sick and benefit funds.

A vote of thanks to the Chairman and Directors for their services during the past year brought the proceedings to a close.

GAS COMPANIES RESULTS IN 1925.

Bishop's Stortford, Harlow, and Epping.

The payment of dividends for the past year by the Bishop's Stortford, Harlow, and Epping Gas and Electricity Company at the rates, less income-tax, of £6 1s. p.ct. on the "A" ordinary stock and £5 15s. p.ct. on the "B" ordinary stock will leave a balance of £1815 to the credit of the profit and loss account to be carried forward. The sale of gas in 1925 was 6·3 p.ct. more than in the preceding year, while that of electric current was 10 p.ct. more.

Croydon.

Compared with 1924 the sales of gas show an increase of 4·73 p.ct. During the year the number of consumers increased by 3062, and in the same period the increase in gas appliances, as supplied by way of sale or hire, was 18,597. During the year progress has been made with the erection of an additional retort house and with a new showroom and district office at Purley. The accounts show that, after deducting the June dividends and providing for all fixed charges, there remains available for division a balance of £46,983; and the Directors recommend that dividends be declared for the half-year at the following rates p.ct. per annum: Preference stock, 7½; sliding-scale stock, 6¼; maximum dividend stock, 5. This will leave a balance of £10,088 to be carried to the next account.

Halesowen.

The annual meeting of the Halesowen Gas Company was presided over by Mr. G. F. Grove (Chairman). The Directors' report showed that the profit for the year amounted to £3270. They recommended the payment of final dividends of £12 p.ct. per annum on the "A" shares and £8 8s. p.ct. per annum on the "B" shares, less income-tax; that £1500 be placed to the renewals account; and that the balance of £313 be carried forward. The report was approved.

Harrogate.

The statutory dividend of 10 p.ct. for the year was declared at the annual meeting of the Company, when there was reported an increase in 1925 over the sales of gas in 1924 of 32,242,400 c.ft., or 148,314 therms. The Special Order empowering the Company to purchase the undertaking of the Pateley Bridge Gas Light and Coke Company was duly granted by the Board of Trade, and the undertaking was transferred to the Harrogate Gas Company on July 1, 1925. The mains connecting the supplies from Harrogate to the area taken over were at once proceeded with, and the gas supply as far as the village of Darley is completed, and the main in the intervening area is now being laid. To the area supplied by the old Company at Pateley Bridge considerable extensions have been made, and 118 new consumers added. In the six months since the Company took over the Pateley Bridge works 3,037,900 c.ft. of gas has been supplied, which is equal to an increase of 47 p.ct. on the corresponding period of the previous year.

Liverpool.

The annual meeting of the Liverpool Gas Company was held on Feb. 16—Mr. H. Wade Deacon, Chairman of Directors, presiding. The year 1925, said Mr. Deacon, was in some ways a difficult one, but taken as a whole the results were satisfactory. In spite of competition with electricity, there was an increase of 2½ p.ct. in the gas sold, and all previous records had been beaten. Capital account showed that they had spent £104,562, of which £30,178 was expended on new cookers and fires. Business in these appliances was increasing. There was an increase of £77,785 in receipts from the sale of gas—owing partly to the increased quantity sold, and partly to the increased price. During the first quarter of the year the price was 7·4d. per therm, which was increased to 8d. at the end of the quarter. They had received about £3000 more from the rents of meters, fires, &c., and there was every reason to expect that these receipts would continue to grow. There had been a heavy slump in the price of coke, and they had received £58,519 less than in 1924. Tar had yielded practically as much as in the previous year, but there had been a serious drop in the yield from sulphate of ammonia. Taken as a whole, residual products had produced £63,699 less than in 1924. From all sources the income was £1,402,159—an increase of £16,305. Expenditure on the manufacture of gas showed a decrease of £22,738, of which £16,406 occurred in the cost of coal and oil. Wages were a little less, owing to the closing-down of the old Caryl Street Works. These works were old-fashioned; and it was their intention to demolish them. Application would be made to the Board of Trade for permission to apply what was necessary out of the special purposes fund of £76,272 in payment for the plant at the other stations which had replaced the obsolete plant. Altogether the expenditure amounted to £1,226,219, which left a balance of £175,940 to carry to the net revenue account. The Chairman, after speaking on the Government electricity scheme, proposed payment of a dividend for the half-year ended Dec. 31 of £2 15s. p.ct. on the ordinary stock of the Company, making a total dividend for the year of 5½ p.ct. The motion was approved.

Weston-super-Mare.

The record set up in 1924 for the sale of gas was exceeded in 1925; the increase over 1924 being 2·98 p.ct., and the total quantity sold over 358 million c.ft. The Directors recommend the payment of the maximum dividend of 5 p.ct. on the ordinary stock.

Whitby.

The report of the Directors of the Whitby Gas Company states that for the year 1925 the profit and loss account, after charging interest and providing for the interim dividend, shows a balance of £1992, out of which they recommend the payment of dividends at the rate of 3 p.ct. on the original capital, and of £2 2s. p.ct. on the additional and new additional capital, for the half-year ended Dec. 31—making, with the interim dividend for June, 6 p.ct. and £4 4s. p.ct. respectively. This will absorb £918, leaving a balance of £1074 to be carried forward.

CLITHEROE CORPORATION GAS (EXTENSION) ORDER.

The Clitheroe Corporation Gas (Extension) Order, which the Board of Trade propose to make under section 10 of the Gas Regulation Act, was the subject of an inquiry by Mr. J. F. RONCA (Director of Gas Administration) at the Board of Trade Offices on Thursday, Feb. 18. The main purpose of the Order is to confirm an agreement under which the Clitheroe Corporation are to acquire the non-statutory gas undertaking of the Bold Venture Lime Company, Ltd., who supply gas in the villages of Chatburn and Downham, in the rural district of Clitheroe. The only opposition came from the London Midland and Scottish Railway Company, who were represented by Mr. H. W. James and Mr. E. S. D. Moore. There were present on behalf of the Clitheroe Corporation Mr. R. Carr Dodds (Messrs. Lewin, Gregory, & Co., Parliamentary Agents), Mr. W. Self Weeks (Town Clerk), Alderman W. W. Whiteside (Chairman of the Gas Committee), and Mr. R. Barrett (Gas Manager).

The opposition of the Railway Company concerned a clause providing that if the Corporation serve notice upon any consumer to the effect that an officer or servant of the Corporation has reported his opinion, after inspection of any internal piping or gas-consuming appliance or fitting on the consumer's premises, that it is in such a condition as to be dangerous to the occupiers of the premises, the consumer shall forthwith carry out such works as may be necessary to remove the cause of danger. If the consumer fails to carry out the works forthwith, the Corporation will be empowered to cut-off the supply. The Railway Company urged that such provisions should not apply to them.

Mr. DODDS (for the Corporation) pointed out that there were precedents for this clause, though they were new, in a way; and the Corporation did not see why the Railway Company should be put into a different position from that of any other consumer. The Corporation were content, however, to leave the matter in the hands of the Board of Trade.

Mr. JAMES (for the Railway Company) said that apparently, on the face of it, this clause gave no right of access whatever to any servant or officer of the Corporation to the Railway Company's premises in order to make a report on the internal piping or gas-consuming appliances. Even if it did, a dustman or a rate collector might report to the Corporation if he detected a slight smell of gas, and a notice would be sent to the Railway Company. There was no suggestion that the officer of the Corporation was to be a skilled officer. He emphasized this because the Railway Company, as a matter of practice, dealt with their lighting arrangements in a very careful manner. They had highly technical and competent staffs, who supervised the whole of the lighting arrangements throughout their system, which was divided-up into areas under the control of engineers, each area being supplied with a gasfitting department, whose men were sent out immediately anything untoward occurred. The Company had standardized their appliances, piping, and works; and it was perfectly clear that this was the proper way to deal with the matter. Again, if, under this clause, a dustman or a rate collector reported to the Corporation that a particular appliance was dangerous, the Railway Company would have no appeal.

Mr. DODDS said that the Corporation would meet the Company's point with regard to the qualification of their inspector. Obviously, the inspection would be carried out by the Gas Manager, or any officer authorized for the purpose.

Mr. RONCA pointed out that if, as Mr. James had submitted, the Corporation had no right of entry to the Company's premises, then his objection to anyone having the right of inspection vanished.

Mr. JAMES replied that an official of the Corporation might be on the station platform quite legitimately as a passenger. If two or three by-passes were blown out, and he noticed a strong smell of gas, he might report to the Corporation that the condition of the appliances was dangerous, and the Company might be called upon to do something which was unnecessary. They might have to use apparatus which was not in accordance with their proved standards, merely at the whim, or owing to the peculiar view, of the Corporation. In the North Middlesex Order a provision with regard to access had been inserted; and in the Rochdale Corporation Bill provisions had been inserted to the effect that, except in case of emergency, 24 hours' notice must be given before entry.

Mr. DODDS said that this would destroy the effect of the clause, which was designed to meet cases of danger.

Mr. RONCA pointed out that the 24 hours' notice was to be given "except in cases of emergency;" and he would have argued that a condition dangerous to the occupiers of the premises was a case of emergency. Alluding to the statement that under the clause the Railway Company would have no appeal against the decision of the Corporation, he asked Mr. James whether he had in mind the reference of the matter to any particular tribunal in the event of differences arising between the Company and the Corporation as to whether certain fittings were or were not dangerous.

Mr. JAMES replied that the Company did not wish to be subject to the provisions of the clause; but, assuming they were, he should imagine that the Company would be satisfied if the matter were referred to the gas examiner appointed under the Gas Regulation Act. He had not, however, given the matter consideration. He agreed that there might not be an examiner. Proceeding, he pointed out that a similar clause was contained in the Halifax and Chorley Bills, promoted in the present session of Parliament, and being opposed by the Railway Companies. The Company might ask the Board of Trade, a little later, not to approve the Order immediately, pending the decision in those cases.

At this point the matter was left in the hands of the Board of Trade.

Mr. DODDS then outlined briefly the proposals of the Order, and gave particulars of the transfer of the Bold Venture Lime Company's undertaking to the Corporation. The Company's undertaking, he said, was capable of producing 30,000 c.ft. of gas per 24 hours. The carbonizing plant was in good condition; but the purifying apparatus was inefficient. The number of consumers was 232; and the gas produced last year amounted to 4,150,000 c.ft. It was proposed to scrap the existing works, and to supply from Clitheroe by means of an 8-in. main. Of the purchase price of £2900, £2000 was in respect of the existing mains of the Company, £600 for the scrapping of the works, and £300 would be allocated to goodwill.

The charge of the Company is 6s. per 1000 c.ft.; and the Corporation supply at 3s. 6d. The Order fixes the maximum price at 16d. per therm within the Corporation's existing limits of supply, with a differential of 6d. per therm, making the maximum price 22d. per therm in the area to be taken over from the Company. It was stated by Mr. Barrett that it was proposed to charge in the Company's area slightly less than the present price.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

The market has been idle and weak, and values continue to relapse. The demand which carried prices up so quickly at the beginning of the year seems entirely to have disappeared, and, though the tonnage position has improved to some extent, more collieries are short of trade than when it was at its worst in recent weeks.

It is difficult to find reasons for the present weakness, but it is safe to assume that much of the recent buying was in anticipation of possible trouble in the industry. This undoubtedly carried prices ahead too rapidly, to a point at which they were no longer tempting. The reaction has now set in, and is, perhaps, accentuated by the better prospects of a peaceful settlement which the daily Press assures us now exist.

Gas coals have been in quieter demand like other sorts; but the better qualities are in a good position, and able to maintain quotations. Wear Specials quote 19s. to 19s. 6d., and best qualities are round 18s. f.o.b. Seconds have weakened considerably, and are obtainable at 15s. 3d. to 16s. Durham unscreened coking is a very poor market, and quotations have fallen to about 15s. to 15s. 6d. Durham bunkers, too, are in very slow demand; best sorts being down to 16s. to 16s. 6d. f.o.b.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

The demand for domestic coal in Yorkshire and Lancashire has fallen off during the last few weeks, and some of the prices that were slightly increased as a result of the extra demand during December now show a tendency to decline. This applies particularly to the Metropolitan area.

The industrial situation does not improve in any direction. The majority of the key industries appear to be marking time until there is a possibility of a more settled state of affairs in the coal trade. They are looking forward with a great deal of anxiety to a reduced price for steam-raising coal, this being, in their opinion, the only way in which a better state of affairs can be secured.

Pig iron is still coming into this country—to the Tees and other centres— at a price considerably less per ton than it can be manufactured here. It is, therefore, apparent that, in addition to cheaper coal, there will have to be cheaper carriage facilities.

Gas Boards are still inclined to buy quantities much more ahead than in normal times, and prices have maintained a fair average so far. Whether the policy is justified or not is problematical; but business of this description cannot very well be treated as in ordinary cases where a forward policy means either failure or success of a business venture.

Export is spasmodic, with washed doubles in the best demand, with other qualities inclined to be reduced from last year's prices.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports: South Yorkshire—Hards, Association, 21s. to 21s. 6d.; screened gas coal, 20s. to 20s. 6d.; washed doubles, 20s. to 20s. 6d.; washed singles, 18s.; washed smalls, 12s. 6d.; unwashed doubles, 18s.; rough slack, 9s. 6d.; smithy peas, 19s. to 20s. 6d. West Yorkshire—Hartleys (f.o.b. Goole), 18s. to 19s.; washed doubles, 18s. 6d.; washed singles, 17s. to 17s. 6d.; washed smalls, 12s. 3d.; unwashed trebles, 16s.; unwashed doubles, 14s.; rough slack, 10s.; coking smalls, 9s. 6d. to 10s. 3d. Derbyshire and Nottinghamshire—Top hards, 21s. 6d. to 23s. 6d.; washed smalls, 12s. to 12s. 3d.; rough slack, 9s. 9d. to 10s. 3d. Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, 18s. to 20s.; gas coke, 24s. 6d.; furnace coke, 18s. 6d. to 19s. 6d. per ton.

COAL TRADE IN THE MIDLANDS.

From Our Local Correspondent.

A market symptom is the opening of negotiations with regard to gas coal contracts over the year beginning next July. There is nothing concrete to report; but it is significant that soundings are being taken on the assumption that the present price level is not maintainable. This is certainly the buyer's idea. Moreover it is a point of view that some of the collieries, at all events, appear to consider reasonable, though how far they will be prepared to commit themselves has yet to be seen. Big consumers refuse to contemplate any settlement of the conflict in the coalfields which does not give relief in regard to prices. This attitude is strongly in evidence so far as industrial users are concerned.

There is no improvement in the demand for works fuel. Smalls and slacks are distinctly easier. Although most of the collieries are working full time, and there is no noticeable congestion of stocks, some relaxation of activity is becoming apparent; the seasonal decline in the house coal trade being a factor. Spot lots are more readily obtainable at reduced rates, and one colliery in the Cannock Chase district has announced a revision of list prices.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Feb.* 22.

The demand for pitch continues, and in face of the shortness of supplies the price is running up rather rapidly. It is reported that over 70s. per ton has been paid for this season's shipment. A similar figure is also obtainable for next season, and the whole position is exceedingly firm.

Creosote maintains a steady tone, and is firm at 7⅛d. to 7¼d. per gallon naked at makers' works for both prompt and forward shipment.

Tar spirits and pyridine are unchanged at the figures last reported.

Tar Products in the Provinces.

Feb. 22.

Markets for tar products are generally speaking firm.

In pitch there have been substantial buying orders from the Continent, with the result that there has been a further advance in the market, which closed at about 73s. to 75s. for prompt and 70s. for next season's delivery.

The creosote market is firm, and business continues to be done at existing prices.

Benzole is steady, with a particularly good demand for delivery over the coming summer. Solvent naphtha is quieter, and it is difficult to get consumers to purchase very far ahead.

Heavy naphtha is entirely neglected.

Cresylic acid is steady, and the demand is good, particularly for special qualities.

The average values for gas-works products during the week were: Gas-works tar, 49s. 3d. to 54s. 3d. Pitch, East Coast, 73s. to 74s. f.o.b. West Coast—Manchester, 67s. 6d. to 68s. 6d.; Liverpool, 68s. to 69s.; Clyde, 71s. to 72s. Benzole, 90 p.ct. North, 1s. 8½d. to 1s. 9½d.; crude, 65 p.ct., at 120° C., 1s. 1d. to 1s. 2d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 8½d. to 1s. 9½d. Toluole, naked, North, 1s. 8d. to 1s. 9d., nominal. Coal-tar crude naphtha, in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 6d. Heavy naphtha, North, 11½d. to 1s. 0½d. Creosote, in bulk, North, liquid, 6½d. to 6¾d.; salty, 6d. to 6⅛d.; Scotland, 5⅞d. to 6d. Heavy oils, in bulk, North, 6⅞d. to 7d. Carbolic acid, 1s. 4d. to 1s. 5d. prompt. Naphthalene, £11 to £14; salts, £4 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

TRADE NOTES.

"Duplex" Controllers.

The Bedwellty Urban District Council have just installed 300 "Duplex" controllers, supplied by Metropolitan Gas-Meters, Ltd., of Hyson Green, Nottingham.

Complete Gasification Plants.

Messrs. Tully, Sons, & Co., of Newark-on-Trent, have received an order from the Prestonpans Gas Company for the erection of a complete gasification plant of 300,000 c.ft. daily capacity. This is in addition to the two existing plants which have been supplying the town with all its gas for the past few years. The same firm have just put into operation a second installation at the Tranent Gas-Works.

CONTRACTS OPEN.

Coal.

Tenders are invited by the Gas Committee of the Borough of East Retford for 10,000 tons of gas coal. [See advert. on p. 491.]

The Gas Committee of the Borough of Lytham St. Annes are inviting tenders for the supply of 7500 tons of peas or slack. [See advert. on p. 491.]

Laying and Taking Out Mains.

The Hathersage and District Gas Company are inviting tenders for laying and taking out gas mains. [See advert. on p. 491.]

Carbonizing Plant, Charging and Discharging Machinery, Condensing, &c., Plant, Exhauster and Engine, Weighbridges.

The Hoylake and West Kirby Urban District Council are inviting tenders for carbonizing plant, machinery, exhauster, condensing plant, weighbridges, &c. [See advert. on p. 491.]

British Taroleum Company, Ltd., of 83, Bridge Street, Manchester, with a nominal capital of £10,000, will carry on business as tar and chemical manufacturers.

Gas Lighting Centenary at Arbroath.—This month marks the centenary of the introduction of gas lighting into Arbroath. The first gas maker in the town is stated to have been James Renny, a candle-maker, who had his own candle shop illuminated with gas. It was not, however, until some time after this that it was decided to proceed with the installation of a gas-works for the town.

Ideal Homes Exhibition, Sheffield.—This exhibition, which terminated on Saturday last, the 20th inst., proved an unqualified success, and was patronized by thousands of people. It is interesting to note that, as a result of a voting competition by the public for the most attractive stand in the exhibition, the first prize for local exhibitors, consisting of a gold medal and certificate, has been awarded to the Sheffield Gas Company. As in former exhibitions, the Company aimed at furnishing a stand attractively; and the secret of their success is undoubtedly due to the splendid display of artistic gas lighting. The contract for the outdoor lighting of this exhibition was again placed in the hands of the Sheffield Gas Company, as well as the erection of a gas flare in the tower of the building, to act as an advertising medium to attract people to the exhibition. It may be mentioned that, from its peculiar position, the flare could be seen miles away in the outlying districts.

Wellington Tube Works, Ltd.

An interesting gathering took place at the Wellington Tube Works, Ltd., Great Bridge, Staffordshire, on Friday, Feb. 19, when the agents and travellers of the Company from all parts of the country assembled in Birmingham, and were conveyed to the works by motor car. The morning was spent in a tour of inspection; and this proved most attractive—especially the new buttweld mill, which is said to be the most up-to-date of its kind in the country. The party then returned to Birmingham, and were entertained at lunch at the Queen's Hotel. In the afternoon a conference was held, at which the Chairman of the Company (Mr. Douglas W. Turner) presided. In welcoming those assembled, he pointed out that this was a unique gathering, being the first of its kind since the inception of the firm in 1872. Since that time the firm had consistently progressed, until, as they had witnessed that day, tubes were now being produced by the latest and most scientific methods. He wished them to understand that, in the same way as the production of the tubes had become a science, so also the selling of tubes became more of a science every day. They had a very large production to sell; but the fact that the quality of the tubes now being made was second to none, should materially assist them. A vote of thanks to the Chairman for presiding was proposed by Mr. W. Jones, of the Eastern Counties, seconded by Mr. Parkes, of London, and carried with acclamation. The Chairman, in returning thanks, expressed his appreciation of their constructive criticism, and his conviction that the meeting would be beneficial to all concerned.

William Edgar & Son.—A Company has been registered under this title, with a capital of £10,000, to acquire the business of an engineer and manufacturer carried on by W. Edgar at Blenheim Works, Lower Mall, Hammersmith.

Big Demand for Appliances at Dewsbury.—The Gas Engineer and Manager at Dewsbury (Mr. H. L. Bateman) reports that for the year ended Dec. 31, 1925, no less than 1170 cooking appliances were sold or let on hire. Gas fires and heating appliances sold numbered 118, while water heaters and wash boilers sold reached a total of 84. Lamps and burners sold numbered 682 The demand for gas continues to increase; and the average calorific value reported by the Gas Examiner for the last quarter was 535·9 B.Th.U. (gross).

South Suburban Gas Company.—In the report to be submitted at the meeting next Friday, the Directors state that, owing to continued ill-health, Mr. Charles Hunt has tendered his resignation as a Director; and this has been accepted with great regret. Mr. Hunt joined the Board nearly 24 years ago, and was Chairman for 16 years. The Directors have placed on record their high appreciation of his long and valuable services to the Company. The quantity of gas sold during the year increased by 5·70 p.ct., as compared with the previous year; and the number of consumers by [illegible] number of gas cookers, fires, &c., hired or sold to consumers increased during the year by 10,481, of which 4064 have been sold. The accounts show that, including the balance of £717 brought forward from the previous year, and after providing for all debenture and other interest charges and payment for the first half of the year of a statutory dividend at the rate of 6½ p.ct. per annum, less income-tax, there remains a balance of £40,641, out of which the Directors recommend payment for the second half-year of a dividend at the rate of 6½ p.ct. per annum, less income-tax, leaving the sum of £2038 to be carried forward. An application has been made to the Board of Trade (following upon the London County Council's representation to the Board that the Company's standard price should be revised) for an Order under section 10 of the Gas Regulation Act, 1920, to amend the Company's standard price, to increase the borrowing powers of the Company, and for other purposes. In view of the great and continued development of the Company's business, involving large increases in capital expenditure, a fresh issue of stock will shortly be made.

The Directors of the Continental Union Gas Company, Ltd., announce that an interim dividend of 3½ p.ct., less tax at 4s. in the pound, will be payable on April 12 next on the preference stock, on account of the year ending June 30, 1926.

The Gas Committee of the Dewsbury Corporation have decided to hold a gas exhibition on an extensive scale in the Town Hall, from April 22 to May 1 next. Miss L. Parkyn, Cookery Demonstrator at the British Empire Exhibition, Wembley, for two years, has been engaged. The Committee have also decided to let on hire gas wash boilers and fires, in addition to cookers, which are already on hire.

A gas explosion attended with fatal results to one workman, named Percy Brown, and injuries to another, occurred at the Birmingham works of Messrs. Frank Ashby & Co., cycle accessories manufacturers, of Stirchley. It is stated that Brown went to relight the gas in a japanning stove, which it is suggested had backfired, when the explosion took place. A large part of the roof was blown away.

Mr. John H. Corrigan, Assistant Manager at the Penrith Gas-Works, was found, on Monday of last week, lying insensible in the retort-house, with a wound in the back of his head. The indications were that he had been struck from behind by a heavy weapon. A stoker employed at the works was stated to have disappeared at the time of the occurrence; and a body thought to be his was subsequently found on the railway line.

Mr. W. J. Liberty, Public Lighting Superintendent, City of London, conducted a large party of engineering and agricultural students from the Polytechnic, Regent Street, through the underground streets of the City of London, on Saturday afternoon last. During the itinerary, Mr. Liberty explained to the party the origin and utility of these labyrinths of underground thoroughfares, especially with regard to main laying and distribution of the various public utility companies.

STOCK MARKET REPORT.

ALTHOUGH business on the Stock Exchange remained restricted in character for the greater part of last week, a much more buoyant tone prevailed towards the close. The dramatic dealings in British Controlled Oilfield shares are still the subject of much comment; and the absence of information from the Directors with regard to the Venezuelan properties is meeting with some criticism. Considerable interest is being taken in the issue of £3,000,000 5 p.ct. redeemable debenture stock by the London Power Company at £96 p.ct. The issue, which is made under the powers conferred by the London Electricity (No. 2) Act, 1925, is expected to be largely oversubscribed. An industrial issue which is rather attractive is that of the International Pulp and Chemical Company 600,000 8 p.ct. cumulative participating preference shares of £1 each at par.

The Home Rail Market was more active than usual. The London and North-Eastern announcement had a depressing effect on the market; but the Southern Deferred benefited by the statement that the Treasury had guaranteed the sum of £2,000,000 for the development of the Kent coalfields.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. Feb. 19.	Rise or Fall.	Transactions Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 4	5	5	Aldershot 5 p.c. max. C. .	74—77	..	..
322,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	69—74	..	..
1,551,868	,,	Oct. 8	6½	6½	Alliance & Dublin Ord. .	69—73	..	69½
374,000	,,	Jan. 7	4	4	Do. 4 p.c. Deb. . .	58—63	..	..
300,000	1	Oct. 22	1/7½	1/7½	Bombay, Ltd.	7/8—1	..	..
170,000	10	Aug. 13	8½	8½	Bournemouth 5 p.c. . . .	12—13	..	12⅞
425,050	10	,,	7	7	Do. B 7 p.c. . .	12—12½	..	12⅝
275,000	10	,,	6	6	Do. Pref. 6 p.c. .	11—12	..	..
50,000	Stk.	Jan. 7	3	3	Do. 3 p.c. Deb. .	55—58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	75—78	..	..
214,740	,,	Aug. 27	12½	12	Brighton & Hove Orig. . .	172—177	..	174
244,200	,,	,,	9½	9	Do. A Ord. .	137—142	..	..
1,287,500	,,	July 23	5	5	Bristol 5 p.c. max. . . .	89—91*a*	..	..
855,000	,,	Oct. 8	7	8	British Ord.	103—108	..	103–103¼
100,000	,,	Jan. 7	7	7	Do. 7 p.c. Pref. . . .	117—122	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	69—74	..	..
100,000	10	Dec. 17	8	6	Cape Town, Ltd. . . .	6½—7½	..	..
100,000	10	Nov. 5	4½	4½	Do. 4½ p.c. Pref. . .	6—7	..	..
150,000	Stk.	Jan. 7	4½	4½	Do. 4½ p.c. Deb. . .	68—73	..	..
626,860	,,	Feb. 18	6	6	Cardiff Con. Ord. . . .	96—99*	−2	..
237,860	,,	Jan. 7	7½	7½	Do. 7½ p.c. Red. Deb. .	98—101	..	..
157,150	,,	Aug. 13	6½	5	Chester 5 p.c. Ord. . . .	90—95*b*	..	..
79,185	1	Oct. 8	—	2/-	Colombo Ltd. Ord. . . .	25/—27/-	..	..
24,500	1	,,	—	1/4½	Do. 7 p.c. Pref. .	21/—23/-	..	21/8—21/6
1,513,280	Stk.	July 23	5/14.8	5½	Commercial 4 p.c. Cap. .	80—85	..	82½
560,000	,,	,,	5⅜	5/8¾	Do. 3½ p.c. Cap. .	80—85	..	..
475,000	,,	Dec. 17	3	3	Do. 3 p.c. Deb. .	55—58	..	..
800,000	,,	Oct. 8	—	4	Continental Union, Ltd. .	33—38	..	33¼—35
200,000	,,	,,	7	7	Do. 7 p.c. Pref. .	88—91	..	89—90½
737,150	,,	Aug. 13	6½	6½	Croydon sliding scale . .	97—101	..	..
403,100	,,	,,	5	5	Do. max. div. . . .	81—84	..	..
492,270	,,	Aug. 13	9	6	Derby Con.	109—111*c*	+2	..
55,000	,,	Dec. 17	4	4	Do. Deb.	74—76*c*	..	..
[illegible]		Sept. 10	5	5	East Hull Ord. 5 p.c. . .	88—91	..	..
[illegible]		Dec. 17	—	5	Eastbourne 5 p.c. Deb. .	93—98	..	..
[illegible]180	10	July 23	4	6	European, Ltd.	5⅜—6⅞	..	..
16,413,285	Stk.	Feb. 18	5¼	4/17/4	Gas Light & Coke 4 p.c. Ord.	79—81*	−1	79½—81⅞
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. . .	58—61*	−1	59–60½
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	75—78*	−2	75½—77
4,761,930	,,	Dec. 17	3	3	Do. 3 p.c. Con. Deb.	58—61	..	58½—59¼
130,000	,,	—	10	10	Do. 10 p.c. Bonds . .	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb	..	..	..
82,500	,,	Sept. 10	6⅝	6⅝	Hastings & St L. 5 p.c. Conv	90—95	..	..
258,740	,,	,,	5⅞	5⅞	Do. 3½ p.c. Conv.	71—76	..	..
70,000	10	Sept. 24	10	10	Hongkong & China, Ltd. .	19½—20½	..	20¼—20⅝
86,600	Stk.	Aug. 13	10	10	Hornsey 7 p.c.	132—137	..	..
1,976,000	,,	Nov. 19	59	10	Imperial Continental Cap.	135—140	+1	136—138½
226,170	,,	Feb. 4	3½	3½	Do. 3½ p.c. Red. Deb.	69—72	..	69½—70
235,242	,,	Aug. 13	6½	6½	Lea Bridge 5 p.c. Ord. . .	97—102	..	..
2,127,340	,,	Feb. 18	5½	5½	Liverpool 5 p.c. Ord. . .	81⅝—82½*b**	−2½	..
600,000	,,	Sept. 24	7	7	Do. 7 p.c. Red. Pref.	103—105*b*	..	..
165,736	,,	Feb. 18	9	8	Maidstone 5 p.c. Cap. . .	115—120*	5½	..
63,480	,,	Dec. 17	3	3	Do. 3 p.c. Deb. . .	54—59	..	..
75,000	5	Dec. 3	7	6	Malta & Mediterranean .	4½—5	..	..
541,920	Stk.	Nov. 19	4	4	Montevideo, Ltd. . . .	69—73	..	71½
2,061,315	,,	Aug. 13	5	5	Newcastle & Gateshead Con.	74⅞—75½*d*	+1½	..
360,929	,,	,,	4	4	Do. 4 p.c. Pref. .	76½—77½*d*	..	..
529,705	,,	Dec. 17	3½	3½	Do. 3½ p.c. Deb. .	70—72*d*	..	..
15,000	,,	Aug. 27	12	11½	North Middlesex 10 p.c. .	160—170	..	..
75,940	,,	,,	8⅜	8⅜	Do. 7 p.c. .	115—120	..	..
300,000	Stk.	Dec. 3	7	9	Oriental, Ltd.	98—103	..	102⅜
188,120	,,	Jan. 7	7⅞	7⅞	Plym'th & Ston'house 5 p.c.	110—115	..	..
60,000	50	Aug. 27	14	14	Portsea Island B . . .	93—96	..	..
100,000	50	,,	13	13	Do. C . . .	90—95	..	..
2,289,909	1	—	—	—	Primitiva Ord.	11/—12/-	..	11/4½—11/9
302,600	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb. . .	82—84	..	..
600,000	Stk.	Jan. 21	4	4	Do. 4 p.c. Red. Deb. 1911	64—66	..	..
193,744	,,	Dec. 17	4	4	Do. B. Aires 4 p.c. Rd. Db.	65—67	..	66½—67
264,496	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	65—67	..	..
150,000	10	Sept. 24	6	6	San Paulo 6 p.c. Pref. . .	7⅞—8¼	..	..
125,000	50	Jan. 4	5	5	Do. 5 p.c. Red. Deb.	43—46	..	..
270,000	Stk.	Aug. 27	5⅜	5⅜	Sheffield A	100—102*e*	..	..
419,968	,,	,,	5⅜	5⅜	Do. B	100—102*e*	..	..
1,047,000	,,	,,	5⅜	5⅜	Do. C	100—102*e*	..	..
90,000	10	June 11	6	4	South African	5—7	..	..
6,609,895	Stk.	Aug. 13	6½	5	South Met. Ord.	93—96	..	93¼—94
1,895,445	,,	Jan. 7	3	3	Do. 3 p.c. Deb. . .	56—59	..	58½
734,000	,,	Sept. 10	6½	6½	Do. 6½ p.c. Red. Db.	104—106	+1	104—105
91,500	,,	Aug. 13	8½	8½	South Shields Con. . . .	124—126*d*	..	..
1,187,795	,,	July 23	6½	6½	South Suburban Ord. 5 p.c.	97—100	..	99
368,837	,,	Dec. 17	5	5	Do. 5 p.c. Deb.	94—97	..	94½
647,740	,,	Oct. 22	5	5	South'mpton Ord. 5 p.c. max.	78—81	..	79—79½
121,275	,,	Jan. 7	4	4	Do. 4 p.c. Deb.	69—74	..	..
250,000	,,	Aug. 27	7	7	Swansea 7 p.c. Red. Pref. .	102—104	+1	103—103½
200,000	,,	Dec. 17	6½	6½	Do. 6½ p.c. Red. Deb.	100—102	..	..
120,000	,,	Feb. 18	7½	7½	Tottenham District A 5 p.c.	107—112*	−3	..
882,275	,,	,,	5¼	5¼	Do. B 3½ p.c.	86—91*	−2	89½—90
150,000	,,	,,	28/4	5½	Do. 5½ p.c. Pref.	101—103*	−2	..
181,255	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	74—77	..	..
258,251	,,	Aug. 27	5	5	Tynemouth Con. and New Uxbridge, Maidenhead, &	69—70*d*	..	..
197,294	,,	Aug. 27	6⅞	6⅝	Wycombe 5 p.c. . . .	93—98	..	..
86,330	,,	,,	5	5	Do. 5 p.c. pref.	90—95	..	..
91,800	,,	,,	6⅞	6⅝	Do. 5 p.c. Maidenh'd	88—93	..	..
30,000	,,	July 9	9⅓	8⅓	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c. .	128—133	..	..
255,636	,,	,,	7⅓	7	Do. B 3½ p.c. .	109—114	..	..
392,955	,,	,,	6/9/6	5/19/0	Do. C and New	92—97	..	..
352,000	,,	,,	7⅝	6⅝	Wimbledon 5 p.c. . . .	100—105	..	..
98,000	,,	,,	7⅛	7⅛	Epsom 5 p.c.	113—118	..	..
88,416	,,	Jan. 7	3	3	3 p.c. Deb.	55—58	..	..

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *Ex. div.

In the Industrial Market, the shares in those concerns able to announce a successful year—such as Tobaccos, Silks, Stores, &c.—were naturally in demand; but Rubbers continued to weaken on the further fall in the price of the commodity, which is now down to about 2s. 4½d. per lb.

The Gas Market was fairly well supported. Apart from *ex* dividend reductions, there were no further falls in the quotations of the ordinary stocks or shares. In fact, Newcastle ordinary advanced again by 1¼ points and the Derby cons. by 2 points on the local Exchanges; and the price at which some of the business was done in various stocks showed the confidence of the buyers. The Barnet, Bournemouth, Croydon, Derby, Newcastle South Shields, South Suburban, and Watford dividend announcements were all at the same rates as for the corresponding half-year of 1924.

The following transactions were recorded during the week:

On Monday, British 103¼, Continental Union 33⅛, 34, 34⅛, 7 p.ct. preference 89, 90, 90¼, European 6, Gas Light and Coke 80⅛, 80⅝, 80⅞, 81, 81¼, 81⅜, 81½, 3 p.ct. debenture 58½, Imperial Continental 137, Primitiva 11s. 4½d., 11s. 7⅛d., South Metropolitan 93¼, 93⅞, 3 p.ct. debenture 58½, 6½ p.ct. debenture 104, 104½, 105, Tottenham "B" 89½, 90.

On Tuesday, British 103, 103¼, European 6, Gas Light and Coke 80½, 80⅝, 80⅞, 81, 81⅛, 3½ p.ct. maximum 60⅛, 3 p.ct. debenture 59¼, Imperial Continental 136, 137, 138½, Oriental 102⅞, Primitiva 11s. 4½d., 11s. 9d., 4 p.ct. (Buenos Ayres) debenture 66⅞, 67, South Metropolitan 93¼, 93½, Swansea 7 p.ct. preference 103. Supplementary prices, Brentford 7½ p.ct. mortgages 104, Danish 7⅞.

On Wednesday, Alliance and Dublin 69½, Bournemouth original 12⅞, Brighton and Hove original 174, British 103, 103¼, Colombo 7 p.ct. preference 21s. 3d., 21s. 6d., Continental Union 35, European 6, 6⅛, Gas Light and Coke 81, 81¼, 81⅛, 81⅜, 81⅞, 3½ p.ct. maximum 59⅜, 60⅛, 4 p.ct. preference 76½, 77, 3 p.ct. debenture 58½, Hongkong and China 20¾, 20⅞, Imperial Continental 137, 3½ p.ct. debenture 69½ *ex* div., Primitiva 11s. 9d., South Metropolitan 93¼, 94, 6½ p.ct. debenture 104, South Suburban 5 p.ct. 99, 5 p.ct. debenture 94½, Swansea 7 p.ct. preference 103½.

On Thursday, Bournemouth "B" 12⅜, Gas Light and Coke 79½ *ex* div., 4 p.ct. preference 75½, 76½ *ex* div., 3 p.ct. debenture 59¼, Imperial Continental 3½ p.ct. debenture 70, South Metropolitan 93¼, Southampton 5 p.ct. maximum 79, 79½. Supplementary prices, Cape Town 5 p.ct. mort. debentures 71½, 71¾.

On Friday, British 103, Commercial 4 p.ct. 82½, Gas Light and Coke 79½, 79⅝, 79⅞, 80, 80¼ *ex* div., 3½ p.ct. maximum 59 *ex* div., 3 p.ct. debenture 58½, Montevideo 71⅛, Primitiva 11s. 4½d., 11s. 8½d., South Metropolitan 94, South Suburban 5 p.ct. 99.

Money was cheap in Lombard Street at the end of the week, the outcome of the Treasury Bill allotment being a still lower average rate of £4 2s. 6·68d. p.ct.; and the full amount offered was allotted. Overnight loans were obtainable at 3½ p.ct., or less.

A fresh record was reached by the French exchange on Saturday, when certain transactions were concluded at as much as 137.40, the rate finally closing at 136.97½. In other exchanges, the movements were small and infrequent. Sterling on New York was ⅛ lower at 4.86⅜, and the Belgian franc was steady at 107. After a long period of steadiness at 1s. 6 5/8d., the Indian rupee eased ⅛d., to 1s. 6 3/16d.

In the absence of selling, Bar Silver recovered ⅛d. to 30⅜d. per oz.; but Gold remained at the normal price, 84s. 11½d. per oz.

The Bank Rate is 5 p.ct., to which it was raised from 4 p.ct. on Dec. 3. Bankers' deposit rates were 3 p.ct. The deposit rates of the discount houses are 3 p.ct. at call and 3⅛ p.ct. at notice.

Demy 4to. Limp Cloth. Price 10s. 6d.

THE FLOW OF GASES and PROPORTIONING GAS MAINS.

By

F. SOUTHWELL CRIPPS, Assoc.M.Inst.C.E.

WALTER KING, LTD., "GAS JOURNAL" OFFICES, No. 11, Bolt Court, FLEET, STREET, E.C. 4.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON TUESDAY, to ensure insertion in the following day's issue.

Orders to Alter or Stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Monday.

UNDISPLAYED ADVERTISEMENTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum, 4s. 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

		ONE YEAR.	HALF-YEAR.	QUARTER.
United Kingdom & Ireland	Advance Rate:	35/-	18/-	10/-
	Credit Rate:	40/-	21/-	11/6
Dominions & Colonies & U.S.A Payable in Advance		35/-	—	—
Other Countries in the Postal Union. Payable in Advance		40/-	22/6	12/6

In payment of subscriptions for "JOURNALS" sent abroad, Post Office Orders or Bankers' Drafts on London only are accepted.

All Communications, Remittances, &c., to be addressed to WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.

GAS PURIFICATION & CHEMICAL CO., LTD.,
PALMERSTON HOUSE,
34, OLD BROAD STREET, LONDON, E.C.2.

OXIDE OF IRON
FOR SALE OUTRIGHT, OR ON LOAN.

SPENT OXIDE
PURCHASED IN ANY DISTRICT.

Telegrams: "PURIFICATION, LONDON."
Telephone: LONDON WALL, 9144.

"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for Gas-Works.
ANDREW STEPHENSON, Gresham House, Old Broad Street, LONDON, E.C. "Volcanism, London."

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
99, LONDON ROAD, LEICESTER.

Telegrams: "BRIPURIMAT, LEICESTER." Telephone: LEICESTER 5096.

Solicit enquiries for:—
NATURAL BRITISH PURIFYING MATERIAL,
NATURAL HYDRATED OXIDE OF IRON,
FIRST QUALITY DUTCH BOG ORE,
BEST QUALITY BELGIAN BOG ORE,
"PREPARED" AND "UNPREPARED" ARTIFICIAL OXIDES.

SPENT OXIDE PURCHASED.

LONDON OFFICE:
34/35, NORFOLK STREET, STRAND, W.C. 2.
Telegrams: "BRIPURIMAT ESTRAND LONDON." Telephone: CENTRAL 6364.

GEORGE WILSON GAS METERS, Ltd.
for
GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS.
Foleshill Road, COVENTRY.
Telephone: 596. Telegrams: "GASMETER,"
and at 268, Stockport Road, MANCHESTER.
Telephone: RUSHOLME 976. Telegrams: "GASMETER,"
and 46 & 47, Auckland Street, LONDON, S.E. 11.
Telephone: HOP 647. Telegrams: "GASEOUS LAMB."

SULPHURIC ACID.

SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD.,
with which is amalgamated WM. PEARCE & SONS, LTD., 36, Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN, LONDON."
Telephone—ROYAL 1166.

ENQUIRIES SOLICITED.

FOR Gas Works Plant of Every Description; also SULPHATE OF AMMONIA and SULPHUR RECOVERY PLANTS.
C. & W. WALKER, LIMITED,
DONNINGTON, NEWPORT, SALOP.

WEIGHBRIDGES

FOR Motor Lorries and Railway Traffic can be seen erected at our works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.
CHARLES ROSS, LIMITED,
SHEFFIELD.

HUTCHINSON BROTHERS, Ltd.,
FALCON WORKS, BARNSLEY,

MANUFACTURERS OF
GAS METERS (Ordinary and Slot),

"FALCON" INVERTED LAMPS,
SQUARE STREET LANTERNS
SUPERHEATER BURNERS, and
CONVERSION SETS for Street Lanterns.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.

WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.

REPAIRS RECEIVE PROMPT ATTENTION.

Telephones: 815, Oldham, and 2412 Hop, London.
Telegrams—
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

MEWBURN, ELLIS, & CO.,
CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C. 2.
Telegrams: "Patent, London." Phone 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

"LUX" PURIFYING MATERIAL

THE PREMIER MATERIAL FOR GAS PURIFICATION.

THOS. DUXBURY AND CO.
SOLE AGENTS FOR
ENGLAND, SCOTLAND, IRELAND, WALES AND THE COLONIES (except CANADA).

16, DEANSGATE, MANCHESTER.
Telegrams: "Darwinian, Manchester." *Tel. Nos.:* 8268-9 City.

PALACE CHAMBERS, WESTMINSTER, S.W.1.
Telegrams: "Darwinian, Parl, London." *Tel. No.:* 6273 Victoria.

SPENCER'S Patent Inclined HURDLE GRIDS.

THE very best Patent Grids for Holding Oxide Lightly.

See Advertisement, Jan. 20, p. 176.

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in connection with Sulphate Plants.
We Guarantee promptness with efficiency for Repairs.
JOSEPH TAYLOR (SATURATORS), LTD., Chemical Plant Engineers, Blackhorse Street Mills, BOLTON.
Telegrams—"SATURATORS, BOLTON." Telephone 848.

SULPHURIC ACID.

JOHN RILEY & SONS, Limited, Chemical Manufacturers, Hapton, near Burnley, are MAKERS of Special SULPHURIC ACID ("Eagle" Brand), for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 60 years. Reference given to Gas Companies.

J. E. C. LORD (Manchester), Ltd., Ship Canal Tar Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, &c.

PATENTS, Trade Marks, Inventions Advice, Handbook and Consultations free. KING'S PATENT AGENCY LTD., Director B. T. KING, C.I.M.E., Regd. Patent Agent, G.B., U.S., and Can., 146A, QUEEN VICTORIA ST., E.C. 4, and 6, QUALITY CT. (next Pat. Off.), LONDON, W.C. 39 years' refs. 'Phone Cent. 682.

APPOINTMENTS, &c., WANTED.

APPLICANT with Nine Years' Experience, at present employed as Technical Assistant in large Modern Works, and possessing Highest Qualifications in Gas Engineering, Silver Medal for Gas Supply, also other Qualifications, DESIRES CHANGE and seeks SIMILAR POSITION in another undertaking.
Intimate Practical Working Knowledge of Verticals, Horizontals with Stoking Machinery, C.W.G., Sulphate and Tar Plants, also Condensation Purification processes, and Laboratory Work.
Address No. 7631, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

OXIDE OF IRON.

SPENT OXIDE BOUGHT.

BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"KLEENOFF," THE COOKER CLEANSER.
Tins for Sale to Consumers.
In Bulk for Works Use.
(*See "The Gas Salesman," p.* 24).

BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Royal 1484.

EXPERIENCED Lecturer and Demonstrator in Cooking by Gas can give Local Demonstrations for Gas Undertakings.
Gas Engineers should apply now for vacant dates to Miss H. H. TUXFORD, M.C.A., "SOUTHBOURNE," BOTTESFORD, NOTTS.

APPOINTMENTS, &c., VACANT.

WANTED — General Chemist for Works. Must have Thorough Knowledge in Tar Distillation.
Applications Stating Age, Full Particulars of Experience, and Salary required, together with *copies* of two Testimonials, to be submitted not later than March 1, to No. 7633, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

MANCHESTER CORPORATION.
(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of SHIFT SUPERINTENDENT for the Bradford Road Gas-Works of the above Department. Applicants must have had Experience of Modern Types of Gas Plant, Vertical and Horizontal Retorts, Carburetted Water-Gas Plant, &c., and used to the Control of Men. Salary, £400 per Annum. No Bonus.
Applications, endorsed "Shift Superintendent," giving full particulars of Training, Experience, and Age, together with References, must be addressed to the Chairman of the Gas Committee, Town Hall, Manchester, not later than Thursday, the 4th of March, 1926.

J. H. SILLITOE,
Secretary.

Gas Department,
Town Hall, Manchester,
February, 1926.

BLACKPOOL CORPORATION.
(GAS DEPARTMENT.)

WANTED — Carbonizing Foreman, Shift Work, knowledge of Continuous Verticals essential.
Applications, stating Wages required, Age, Training, and Experience, together with recent Testimonials, to be forwarded to the undersigned.

JOHN H. CHEW,
Engineer and Manager.

Gas Office,
Princess Street,
Blackpool.

WANTED — Experienced Constructional Steelwork DRAUGHTSMAN. One accustomed to Gas-Works' Plant preferred. Good Salary paid to first-class man.
Applications to DRAKES, LTD., HALIFAX, YORKS.

COAL Factors require Representative for Eastern Counties and district round London. Gentleman with Connection among Gas Undertakings preferred. Salary and liberal Commission.
Apply, with full Particulars, stating Age, Experience, &c., to No. 7640, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WANTED—Silica Brick Representative. Must be well-known to Gas Engineers in London and South of England.
Applications to STEPHENS & CO., KIDWELLY.

GAS FITTERS Wanted — Provincial District. Must be thoroughly qualified.
Write, stating Age, Training, Wages required, and enclosing *copies* of Testimonials, to No. 7639, "GAS JOURNAL," 11, BOLT COURT FLEET STREET, E.C. 4.